

Additamenta ad Floram Anatoliae: III*

BY

P. H. DAVIS

With Contributions by V. H. HEYWOOD and A. HUBER-MORATH

In 1950, accompanied by Mr. V. H. Heywood, a summer visit was paid to the South Aegean and to Western Anatolia. The mountains climbed in Turkey during August were as follows: Baba Dağ (Cadmus) from Kadiköy, Boz Dağ (Tmolus) from Ödemiş, and the Phrygian peak of Şaphane Dağ (N. of Gediz) from Şaphane—a mountain not previously botanised. The collections from these mountains—in so far as they affect the *Labiatae* and *Scrophulariaceae*—are included in this annotation. The other Turkish specimens of the *Scrophulariaceae* were collected in 1947 and 1949. Specimens from Samsun Dağ (Mykali), which we climbed from the ruins of Priene, will be enumerated in a separate contribution on the Aegean flora.

I am particularly indebted to Mr. V. H. Heywood (Botany School, Cambridge) for his contribution on *Digitalis* and the difficult genus *Scrophularia*, and to Dr. A. Huber-Morath (Basle) for determinations of *Verbascum* and *Celsia*.

LABIATAE (continued)

Ballota nigra L., Sp. Pl. 582 (1753).

Subsp. **ruderalis** (Swartz) Briquet, Lab. Alp. Marit., 275 (1891).—Syn. *B. nigra* L. subsp. *nigra* (nom. subspecif. ambiguum); *B. foetida* Lam., Fl. Franç., 2, 381 (1778), quoad syn., nomen illegit.; *B. ruderalis* Swartz in Svensk Bot. t. 389 (1809); *B. vulgaris* Hoffm. et Link, Fl. Portug. 6, 115 (1809).

Subsp. **foetida** Hayek, Prodr. Fl. Balc. 2, 278: 1929.—Syn. *B. foetida* Lam., Fl. Franç., 2, 381 (1778), quoad descr., nomen illegit.; *B. alba* L., Fl. Suecica, ed. 2, 206 (1755); *B. borealis* Schweig. in Königsberg. Archiv. Naturw. 1, 214 (1812), Reichenbach, Icon. Bot. 8, t. 776 (1830).

Subsp. **anatolica** Davis, subsp. nov.

Caules ad 70 cm. alti, hirsuti, superne breviter ramosi. Folia late ovata, acuta, basi truncata vel subcordata, 2.5–3.5 cm. longa (inferiora emarceda), utrumque in dentes 10–13 subduplo et regulariter crenato-serrata. Calyx 7–8 mm. longus, quinquefidus, tubo cylindrico in fructu superne haud ampliato; dentes 2–2.5 mm. longi, recurvi, in dimidio inferiore ovati, superne in mucronem 1–1.5 mm. longum sensim attenuati. Floret Jul.–Sept.

TURKEY. Prov. Ankara, distr. Beynam (Galatia): Beynam, in crevices of outcropping limestone rocks in *Quercus* macchie, 1,100 m., 5 July 1947, Davis 13024 (*holotypus* in Herb. Kew.; *isotypus* in Herb. Edin.—“subsp. *ruderalis* (Sw.) Briq.” Davis in Kew Bull. 1949: 395); distr. Ankara (Galatia), Hacıkadun valley near Kecioren, 9 July 1947, Davis 13185A. Prov. Kutahya, distr. Gediz (Phrygia): Şaphane, 1,000 m., edge of orchard, fl. purple, 26 Aug. 1950, Davis 18490 and Heywood. In pascuis Djulfik, Aucher-Eloy, Herb. d'Orient 9109.

* Continued from Kew Bull. 1951, 63–121 (1951).

Subsp. **kurdica** Davis, subsp. nov.

Caules ad 130 cm. alti, glabrescentes vel velutini, superne stricte ramosi. Folia oblongo-ovata, acuta, basi truncata, 4-7 cm. longa (inferiora emarcescentia), pilosa, in dentes ovatos 10-13 simpliciter vel subduplo grosse et irregulariter serrata. Calyx 8 mm. longus, subcylindricus vel angustissimus infundibularis, tubo in fructu superne vix ampliato, ad $\frac{1}{4}$ - $\frac{1}{3}$ quinquifidus; dentes 1.5-2 mm. longi, late triangulares, erecti vel patentes, in mucronem 1 mm. longum abrupte producti.—Floret Jul.—Sept.

IRAQ (Kurdistan). In rupestribus umbrosis montis Gara Kurdistaniae, Kotschy 354 (*holotypus* in *Herb. Kew.*); Jabal, E.N.E. of Seri Hassan Beg, by stream, 2,100 m., 24 July 1932, E. R. Guest 2913.

TURKEY (Kurdistan). Habitat in valle Teng [pr. Muş] locis argillosis alt. 1,600 m., 9 Sept. 1859, Kotschy 511.

Before discussing the taxonomy and distribution of the new subspecies, I give some notes on the nomenclature of *B. nigra* L.

In the first edition of his *Species Plantarum* (1753), Linnaeus described one W. European *Ballota*, *B. nigra* L., but gave it a very inadequate description. He cited his *Hortus Cliffortianus* in the synonymy, and the specimen in the Clifford Herbarium is the plant with broad mucronate calyx teeth generally accepted as *B. nigra* L. in Britain. However, *B. nigra* L. must be typified by Linnaeus's reference to his *Flora Suecica* ed. 1, 176 (1745), from which he repeated the specific description; it is a plant from southern Sweden (Scania: Lund and elsewhere). Except for two gatherings of *B. nigra* subsp. *foetida* Hayek from Stockholm, Swedish *Ballota* material is represented in the Herbaria of Kew, the British Museum and Edinburgh only by the long-toothed plant generally known in Britain as *B. ruderalis* Swartz.

Linnaeus, in the second edition of his *Flora Suecica* (1755), recognised two West European species of *Ballota*: *B. nigra* L. ("*calycibus acuminatis*") and *B. alba* L. ("*calycibus truncatis*"). Specimens of these two species, written up by Linnaeus, are in the Linnean Herbarium, and are to be taken as the lectotypes. The former is the plant British botanists generally name *B. ruderalis* Swartz, and the latter the one they call *B. nigra* L. J. D. Hooker (*Student's Flora of the British Isles*, ed. 3, 330: 1884) and Lindman (*Svensk Fanerogamflora*, 472: 1918) followed the later Linnean treatment, though both cited *B. foetida* Lam. as a synonym of *B. alba* L.; although the description of *B. foetida* Lam. clearly refers to *B. alba* L., it is, however, an illegitimate name substitution for *B. nigra* L., because Lamarck cited the latter as a synonym of *B. foetida*.

To use the name *B. nigra* L. in its narrow sense (excluding *B. alba* L.) would lead to confusion. It is better treated as a *nomen ambiguum* (cf. Article 62 of the International Rules as amended at Stockholm). If the two plants were to be regarded as species, the name *B. ruderalis* Swartz would stand for the acuminate-toothed plant that is a scarce British alien, and *B. alba* for our short-toothed native known as the Black Horehound. However, in Europe intermediates are not uncommon between these two taxa, and I prefer to follow Briquet in accepting them as subspecies of one widespread species. Treated in this broad sense, there is no ambiguity in the use of the epithet *B. nigra* L., and therefore no excuse for abandoning it as the specific name. It is only at the subspecific level that the name becomes a *nomen ambiguum*, so that *B. nigra* L. subsp. *ruderalis* (Swartz) Briquet stands as the typical sub-

species, instead of subsp. *nigra* which would have to be used in accordance with the ruling taken at Stockholm (1950). The correct name for our British native becomes *B. nigra* L. subsp. *foetida* Hayek. Hayek's combination must be taken as a new name, since *B. foetida* Lam. was originally illegitimate.

Subsp. *ruderalis* and subsp. *foetida* are the two major races of *B. nigra* in Europe, and their ranges widely overlap. In N.W. and Central Europe, and in the N. Balkans, both subspecies occur, but in regions with a Mediterranean climate only subsp. *foetida* is found. The latter therefore has a wider distribution than subsp. *ruderalis*, and extends from Scandinavia to the Atlantic Islands, Morocco and N. Persia. Subsp. *ruderalis* stretches from Britain to the Caucasus.

In Turkey both subspecies occur: subsp. *foetida* in the South (Caria, Amanus, Mt. Cassius!) and subsp. *ruderalis* in the North-East—the latter taxon's most southerly extension. The two new subspecies of *B. nigra* also grow in Turkey: subsp. *anatolica* Davis in Central and Western Anatolia, and subsp. *kurdica* Davis in Kurdistan (of both Turkey and Iraq). Taxonomically these seem to be of equivalent status to subsp. *ruderalis* and subsp. *foetida*, and as they occupy particular areas I treat them as geographical subspecies. It seems probable that *B. nigra* originated in or near Turkey, where the maximum morphological diversity is found. The new subspecies often grow in undisturbed habitats, such as shady rocks, whereas the European races are recorded from waste ground, roadsides and hedge banks. A similar history may lie behind *Ajuga Chia* Schreb. and *A. Chamaepitys* (L.) Schreb. (cf. Turrill in New Phytol. **33**, 225: 1934).

Without seeing more material, I am not convinced of the specific status of *B. philistaea* Bornm. from coastal Palestine. Bornmüller originally described it as a variety of *B. nigra*, but later removed it to Sect. *Berengeria* on account of its ten calyx teeth. In Palestine and the Lebanon, material that must be referred to *B. nigra* subsp. *foetida* shows variation in the number of calycine teeth from 5–8—even on the same plant.

No attempt is made here to denominate the minor variants of *B. nigra* in Europe, most of which appear to fall within subsp. *ruderalis* or subsp. *foetida*. A key is given below to the four subspecies dealt with, stressing the differences in calyx shape which primarily serve to distinguish them. I am indebted to Dr. George Taylor, Mr. B. L. Burt and Mr. John Anthony for their help in dealing with the species' nomenclature.

Key to subspecies of *B. nigra* L.

Upper part of calyx-tube manifestly enlarged in fruit. Calyx teeth short and broad, abruptly mucronate *foetida*

Upper part of calyx tube scarcely enlarged in fruit:

Calyx teeth not more than $\frac{1}{3}$ as long as tube:

Teeth nearly $\frac{1}{3}$ as long as the cylindrical calyx tube, acuminate, strongly recurved in fruit; leaves 2.5–3.5 cm. long, broadly ovate *anatolica*

Teeth $\frac{1}{4}$ – $\frac{1}{3}$ as long as the cylindrical or slenderly conical tube, mucronate, erect or spreading in fruit; leaves 4–7 cm. long, oblong-ovate *kurdica*

Calyx teeth from nearly $\frac{1}{3}$ as long as the narrowly conical tube to as long as the tube, lanceolate-subulate, erect or slightly spreading *ruderalis*

Calamintha exigua (Sibth. & Smith) Hal., Consp. Fl. Gr. 2, 546 (1902).

Prov. Kutahya, distr. Gediz (Phrygia): Şaphane, 1,000 m., chalky slope, fl. lilac, annual, procumbent, Davis 18476 and Heywood (*forma ramis procumbentibus, calycibus minus gibbosis a typo differt*).

Calamintha Nepeta (L.) Savi var. **Spruneri** (Boiss.) Hayek, Prodr. Fl.

Balc. 2, 326 (1929).

Prov. Denizli (Caria): Baba Da. above Kadiköy, 1,200 m., 23 July 1950, Davis 18421 and Heywood; between Denizli and Taş Oçağı, fl. pale mauve, 13 July 1947, Davis 13237 ("*C. Nepeta* L.", Davis in Kew Bull. 1949: 395).

Lycopus europaeus L., Sp. Pl. 21 (1753).

Prov. Kutahya, distr. Gediz (Phrygia): Şaphane, by stream, fl. white, 26 Aug. 1950, Davis 18485 and Heywood.

Marrubium astracanicum Jacq., Ic. Pl. Rar. 1, 11 (1781-86) subsp. **astracanicum**.

Prov. Kutahya, distr. Gediz (Phrygia): Şaphane Da., 1,700 m., fl. purple, 27 Aug. 1950, Davis 18468 and Heywood.

Marrubium globosum Montbret & Auch., in Ann. Sc. Nat. Ser. 2, 6, 53 (1836) subsp. **globosum**.

Prov. Denizli (Caria): Baba Da. above Kadiköy, 1,700 m., on schist slopes, 23 Aug. 1950, Davis 18432 and Heywood; *ibid.*, 1,900 m., on limestone, 24 Aug. 1950, Davis 18396 and Heywood.

Marrubium lutescens Boiss., Diagn. Pl. Or. Ser. 1 (5) 34 (1844).

Prov. Kutahya, distr. Gediz (Phrygia): Şaphane Da., metamorphic slopes, 1,900 m., infl. branched, 27 Aug. 1950, Davis 18464 and Heywood.

Marrubium rotundifolium Boiss., Diagn. Pl. Or. Ser. 1 (5) 33 (1844).

Prov. İzmir, distr. Ödemiş (Lydia): Boz Da. 1,500-2,000 m., 16 Aug. 1950, Davis 18224 and Heywood.

Mentha longifolia (L.) Huds., sensu lato sed excl. *M. microphylla* C. Koch.

Prov. İzmir, distr. Ödemiş (Lydia): Bozdağ village, 1,200 m., streamside 15 Aug. 1950, Davis 18199 and Heywood. *Prov. Denizli (Caria)*: Baba Da. near Kadiköy, 1,200 m., fl. lilac, 23 Aug. 1950, Davis 18429 and Heywood.

Micromeria cristata (Hampe) Gris., Spic. Fl. Rum. et Bithyn., 2, 122 (1844).

Subsp. **cristata** (*Typus*: Rumelia, *leg. Friv.*!)

N. Anatolia: Safranbol, *leg. Wiedemann*; Amasia, on Abasihi Dağ, 1,400 m., 27 July 1890, Bornmüller 3028.

Subsp. **xylorrhiza** (Boiss. et Heldr.) Davis, comb. et stat. nov.—Syn. *M. xylorrhiza* Boiss. et Heldr., in Boiss. Diagn. Pl. Or. Ser. 1 (12) 49 (1853).

In fissuris rupium Tauri Pisidici Lycaonici alt. 1,600-1,900 m., in monte Boudroun et monte Anemas, Heldreich (*syntypi in Herb. Boiss.*!). *Prov. Kutahya, distr. Gediz (Phrygia)*: Şaphane Da., W. side, 1,600 m., limestone

rocks, flowers white with mauve spots on lip, 27 Aug. 1950, Davis 18494 and Heywood; *ibid.*, 1,900–2,000 m., sunny rocks, 27 Aug. 1950, Davis 18457 and Heywood. *Prov. Antalya, distr. Gebiz (Pisidia)*: Bozburun Da., between Boğaz Azzi and Tozlu Çukur Y., 1,500 m., 24 July 1949, Davis 15561.

Subsp. **carminea** (Davis) Davis, comb. et stat nov.—Syn. *M. carminea* Davis in Kew Bull. 1949, 400 (1949).

Prov. Denizli, distr. Acipayam (Caria): Boz Da. above Geyran Y., 1,800–1,900 m., on limestone rocks with *Globularia dumulosa* Schwarz, fl. almost carmine, Davis 13403 (*holotypus* in Herb. Kew.). *Phrygia*: Boulgas-dagh, fentes des rochers, 11 July 1857, Balansa 242.

f. inter subsp. **cristatam** et subsp. **xylorrhizam** (Boiss. et Heldr.) Davis.

Prov. Muğla, distr. Fethiye (Lycia): above Duğer, 1,600 m., limestone rocks, flowers very pale mauve with darker spots on lower lip, 6 Aug. 1947, Davis 13813.

Thanks to Dr. Charles Baehni, I have been able to examine all the Turkish material of *M. cristata* (Hampe) Gris. (incl. *M. xylorrhiza* Boiss. et Heldr.) in the Boissier Herbarium. This shows that the typical form of *M. cristata* (widespread in the N. Balkans, from whence it was originally described) in Asia only occurs in Northern Anatolia. In the W. and S.W. Anatolia the species is represented by what I have treated here as subsp. *xylorrhiza* and subsp. *carminea*.

So different are the types of *M. xylorrhiza* and *M. carminea* from that of *M. cristata*, that only the presence of some intermediate specimens has lead me to consider them conspecific. *M. xylorrhiza* (later treated by Boissier in Fl. Or. 4: 570: 1879 as a synonym of *M. cristata*) is morphologically intermediate between the slender small-flowered *M. cristata* and the dwarf large-flowered *M. carminea*. The material cited above includes all the material of this complex that I have seen from Western Asia. A key to the subspecies is provided below.

Geneva Herbarium specimens from Masmeneudag in Cappadocia (Balansa), from Bey Dağ above Malatya (Haussknecht) and from the Lebanon (Blanche) appear to be specifically distinct from *M. cristata* as circumscribed here; they have very short calyces and lack the characteristic sterile shoots of *M. cristata*.

Key to the subspecies of M. cristata (Hampe) Gris.

Flowers 4–6 mm. long, calyx teeth equal in length.

Stems 5–16 cm. tall; spike narrowly cylindrical, 3–7 (10) cm. long, 6–7 mm. wide, rather dense; indumentum typically puberulous; calyx teeth narrowly lanceolate, scarcely ciliate, corolla apparently purple (N. Balkans, N. Anatolia) *cristata*

Stems 3–5 cm. tall; spike oblong, 1–2 cm. long, 6–8 mm. wide, dense; indumentum hispidulous; calyx teeth lanceolate-subulate, ciliate; corolla white with violet spotting (Pisidia, Phrygia, Lycania) *xylorrhiza*

Flowers 8–11 mm. long, the lower calyx teeth somewhat longer than the upper, all acuminate-subulate and stiffly ciliate. Stems 3–6 cm. tall; spike oblong, dense, 1–2.5 cm. long, 1 cm. wide; indumentum hispidulous; corolla carmine (Caria, Phrygia) *carminea*

***Nepeta italica* L., Sp. Pl. 571 (1753).**

Prov. Denizli (Caria): Baba Da. above Kadiköy, 1,900 m., N. scree, under cliff, fl. white, 23 Aug. 1950, Davis 18408 and Heywood.

***Nepeta nuda* L. subsp. *lydiae* Davis, subsp. nov.**

Affinis subsp. *albiflorae* Gams sed indumento hirsuto-velutino canescente, bracteis longioribus divergit.

Caules 40–60 cm. alti, hirsuto-tomentelli, superne stricte ramosi. Folia lanceolato-oblonga, subsessilia, basi subcordata, 3–5 cm. longa, 1.3–2.0 cm. lata, serrato-crenulata, hirsuto-velutina et canescentia ut bractee et calyces. Verticillastra 4–8-nata, approximata vel infima subdistantia. Bractee lineares, acutissimae, uninerviae, angustissime membranaceo-marginatae, tubum calycis ± aequantes. Corolla alba, ♀ ad 6 mm. longa, ♂ ad 9 mm. Calyx 3–6 mm. longus, ad medium in dentes anguste lanceolato-lineares subaequales membranaceo-marginatos fissus.

Prov. Izmir, distr. Ödemiş (Lydia): Yaila de Bozdağ (Tmolus occid.) 18 July 1854, Balansa 322 (*holotypus* in *Herb. Kew.*); *ibid.*, 1,200 m., 15 Aug. 1950, Davis 18179 and Heywood; *ibid.*, 1,600 m., 16 Aug. 1950, Davis 18229 and Heywood (*fruct.*); *ibid.*, 1,700 m., 16 Aug. 1950, Davis 18226 and Heywood (*fruct.*). *Prov. Aydın (Lydia)*: Monte Mesogis supra oppidum Tire, 14 June 1906, Bornmüller 9914 (sub "*N. marrubioide* Boiss. et Heldr.", non Willd.). *Prov. Denizli (Caria)*: Cadmus (Baba Da.), 1842, Boiss.; *ibid.*, above Kadiköy, 1,500 m., fl. white, 23 Aug. 1950, Davis 18446 and Heywood; *ibid.*, 1,500 m., N. schist slopes, fl. white, 23 Aug. 1950, Davis 18432 and Heywood.

The new subspecies of *N. nuda* L. combines the indumentum of subsp. *marrubioide*s Huber-Morath and Davis (though somewhat less dense than in the type of the latter) with the narrower leaf-shape of subsp. *albiflora* Gams, but differs from both in its bracts being as long as the calycine tubes; indeed, the bracts are longer than I have seen in any other form of this polymorphic species. It appears to occupy a well-defined area in Western Anatolia.

The relationship of *N. nuda* to *N. viscida* Boiss. and *N. tmolea* Boiss. requires investigation on Lydian Boz Dağ, where Boissier (*Fl. Or.* 4: 656: 1879) states that hybrids between the three species are frequent. I have not seen the type of *N. viscida*; but Balansa 1178 from Cilician Bulgar Dağ, cited as that species by Boissier (*l.c.*), has calyx teeth as long as the calycine tube—an attribute claimed by Boissier to be diagnostic for *N. tmolea*. *N. nuda* var. *pastoralis* Bornm., from Sultan Dağ in Phrygia, is very close to the isotype of *N. tmolea* Boiss. var. *laxior* Boiss. seen in the Kew Herbarium, which certainly seems to be conspecific with *N. nuda*. *N. nuda* var. *microcalycina* Bornm., *N. meda* Stapf and *N. Navaschini* E. Bordz should be included in *N. nuda* subsp. *albiflora* Gams which is very variable in the size of its flowers. I have not been able to examine *N. nuda* var. *ilgazensis* Czeczott (in Fedde, *Repert. Beih.* 107, 216: 1939) from Paphlagonia.

Intermediates occur between subsp. *albiflora* and the type of subsp. *marrubioide*s, and it is doubtful which specimens should be referred to the latter taxon. The distribution of several specimens determined as subsp. *marrubioide*s is so scattered that I suspect some of the records to be parallel variants in the widespread subsp. *albiflora*; the status of subsp. *marrubioide*s is therefore somewhat doubtful. On the other hand, subsp. *glandulifera* Huber-Morath

and Davis and subsp. *lydiae* Davis have circumscribed areas and well marked diagnostics.

***Origanum heracleoticum* L., Sp. Pl. 589 (1753) var. *heracleoticum*.**

Prov. Denizli (Caria): Baba Da. above Kadiköy, 1,200 m., fl. white, 23 Aug. 1950, Davis 18418 and Heywood.

***Origanum Onites* L., Sp. Pl. 690 (1753).**

Prov. Denizli (Caria): Baba Da. 1,200 m., 23 Aug. 1950, Davis 18419 and Heywood.

***Origanum sipyleum* L., Sp. Pl. 589 (1753).**

Prov. Kutahya, distr. Gediz (Phrygia): Şaphane, 1,000 m., chalky slopes, 26 Aug. 1950, Davis 18480 and Heywood.

***Phlomis armeniaca* Willd., Sp. Pl. 3, 119 (1800).**

Prov. Denizli (Caria): Baba Da. above Kadiköy, 1,500–1,700 m., on schist slopes, 23 Aug. 1950, Davis 18437A and Heywood; *ibid.*, 1,900–2,000 m., on limestone, 24 Aug. 1950, Davis 18397 and Heywood.

***Phlomis carica* Rech. fil. in Öst. Bot. Zeitschr. 89 (4) 273 (1940).**

Prov. Denizli (Caria): Baba Da. above Kadiköy, 1,400 m., on schist slopes, 23 Aug. 1950, Davis 18442 and Heywood.

***Salvia candidissima* Vahl, Enum. Pl. 1, 278 (1804).**

Prov. Kutahya, distr. Gediz (Phrygia): Şaphane Da., chalky slopes, fl. white, 26 Aug. 1950, Davis 18478 and Heywood.

***Satureia cuneifolia* Ten., Prodr. Fl. Nap. p. xxxiii (1811) var. *cuneifolia*.**

Prov. İzmir, distr. Ödemiş (Lydia): Boz Da., 1,200–1,400 m., dominant on schist slopes, fl. white, 15 Aug. 1950, Davis 18171 and Heywood. *Prov. Denizli (Caria):* Baba Da. above Kadiköy, 900–1,500 m., abundant on schistose slopes, fl. white, 23 Aug. 1950, Davis 18425 and Heywood.

***Scutellaria orientalis* L. subsp. *alpina* (Boiss.) Schwarz in Fedde, Repert. 36, 134 (1934).**

Prov. İzmir, distr. Ödemiş (Lydia): Boz Da., 2,000–2,100 m., 16 Aug. 1950, Davis 18208 and Heywood.

***Sideritis libanotica* Lab. subsp. *linearis* (Benth.) Bornm. in Mag. Bot. Lap. 31, 140 (1932).**

Prov. Denizli (Caria): Baba Da., 2,000–2,200 m., erect, fl. lemon-yellow and unlined, 24 Aug. 1950, Davis 18395 and Heywood.

This is the most westerly record for the species.

***Sideritis tmolea* Davis, sp. nov. (Sect. *Empedoclea* Benth.).**

Valde affinis *S. condensatae* Boiss. et Heldr. et *S. Roeseri* Boiss. et Heldr.; a priori verticillastris omnibus remotis, bracteis glanduloso-puberulis, calyce prominentius nervoso longe et patenter villosa recedit; ab altera foliis caulium floriferorum virescentibus, in parte superiore argute mutico-

serratulis vel saltem distincte mucronatis, nervatura valde reticulato-prominente divergit.

Planta basi procumbens, lignescens. Caules floriferi robusti, 20-45 cm. alti, 2 mm. lati, lanati, canescentes, simplices vel ad medium trifidi. Folia turionum sterilium obovato-oblonga, petiolata, obtusa, paululum serrato-crenulata, canescentia; folia caulium florum 3-5 paria, oblonga, 2.5-5.0 cm. longa, 0.8-2.6 cm. lata, sessilia (infima saepe breviter attenuata subpetiolata summa etiam subamplexicaulia), argute serrulata (serrulis summis plerumque muticis), apice obtusa vel \pm acuta manifeste spinoso-mucronata, crasse reticulato-nervosa, sparse lanata, virescentia. Verticillastra 4-10, 1.5-2.0 cm. lata, remota, infima 2.5-5.0 cm. distantia, summa fere approximata, 6-10-flora, in spicam interruptam 4-25 cm. longam disposita. Bractae late triangulari-orbiculares, basi truncatae, cuspidate 2-4 mm. longa terminatae, membranaceae sed firmae, obscure reticulato-nervosae, tubum calycis occultantes, pilis brevissimis glandulosis numerosis et pilis longis eglandulosis paucis glanduloso-puberulae, ad marginem barbatae. Calyx anguste obconicus, 9-11.5 mm. longus, 3.5-5.0 mm. latus, ad $\frac{1}{3}$ - $\frac{2}{3}$ in dentes lanceolatos in mucronem 1 mm. longum acuminatos fissus, fauce paulo obliquus (nervatura aliquantum obscura), glandulis subsessilibus dense munitus, pilis longis eglandulosis patenter villosus parte posteriore basi exclusa. Corolla citrina, 11-14 mm. longa, ad $\frac{1}{4}$ - $\frac{1}{3}$ bilabiata, vix lineis notata, fauce barbata, superne appresse pubescens, inferne glabra; labium superius late ovatum ad $\frac{1}{3}$ bifidum; labium inferius trilobatum, lobis lateralibus triangularibus, mediano late orbiculare. Nuculae ignotae.—Floret Aug.

Prov. İzmir, distr. Ödemiş (Lydia): Boz Da. (Tmolus), 1,900 m., on rocky schistose slopes facing W.-N.W., fl. lemon-yellow, 16 Aug. 1950, Davis 18218 and Heywood (*holotypus* in Herb. Kew.; *isotypus* in Herb. Edin.); *ibid.*, July 1842, Boissier (sub "*S. taurica* M.B." in Boiss. Fl. Or. 4, 710: 1879)!

Both morphologically and geographically *S. tmolea* Davis is intermediate between *S. condensata* Boiss. et Heldr. from the Isaurian and Pisidian Taurus, and the better known *S. Roeseri* from the Balkan Peninsula. The Tmolean species was assigned by Boissier to *S. taurica* Willd., a species that is probably confined to the Crimea, although Hayek (Prodr. Fl. Balc. 2, 258: 1929) records it (as *S. distans* Willd.) from Thrace.

The leaves of *S. tmolea* resemble those of *S. condensata*, but it differs from that species in its remote whorls, glandular puberulent bracts, and calyx with more prominent nervature and much longer more spreading villosity. The new species grows at a higher altitude than *S. condensata* which is found at about 1,000 m.

In the characters of its inflorescence, bracts and flowers *S. tmolea* resembles typical *S. Roeseri* Boiss. et Heldr., but is distinguished from the latter by its leaves: they are greener, more prominently net-veined (in *S. Roeseri* the longitudinal veins are much more pronounced than the connecting ones), end in a hard mucro, and are generally furnished in the upper part with horny mucicous serrations.

The new species is less closely related to *S. dichotoma* Huter (from Bithynian Olympus) and *S. trojana* Bornm. (from Trojan Ida) whose *loci* are about as distant from *S. tmolea* as those of *S. Roeseri* and *S. condensata* are from Tmolus. Despite its slight taxonomic *differentiae*, it seems preferable to assign specific

rank to *S. tmolea* rather than to treat it and *S. Roeseri* as subspecies of *S. condensata*. In the genus *Sideritis* L., attempts at reduction of rank lead one into deep water: the difficulty of choosing the focal points round which subspecies can be centred. As in many other Labiate genera (e.g. *Phlomis* and *Nepeta*), it seems advisable to accept a rather narrow species-circumscription until a thorough revision can be made.

The authority for the Crimean *S. taurica* is generally cited as Marschall von Bieberstein. This is incorrect, as Bieberstein (Fl. Taurico-caucasica, 2, 43: 1808) copied the description from Willdenow who described it as a new species in his edition of Species Plantarum (3, 66: 1800), together with *S. distans* Willd. Boissier (Fl. Or. 4, 710: 1879) treated the latter as a synonym of *S. taurica*, and later authors have accepted his opinion. There is therefore no justification for Hayek's acceptance (Prodr. Fl. Balc. 2, 258: 1929) of *S. distans* Willd. as the correct epithet for the Crimean species; evidently thinking that Bieberstein, not Willdenow, had described *S. taurica*, he erroneously considered *S. distans* to be the earlier name.

Stachys cretica L. subsp. **anatolica** Rech. fil. in Ann. Nat. Hofmus. Wien, 48, 175 (1937).

Prov. *Kutahya*, distr. *Gediz* (*Phrygia*): Şaphane, 1,000 m., chalky slopes, fl. lilac-pink, 26 Aug. 1950, Davis 18479 and Heywood; Şaphane Da., 1,500 m., 27 Aug. 1950, Davis 18471A and Heywood.

Thymus Chaubardii (Boiss. et Heldr.) Čel. var. **boeoticus** (H. Braun) Ronn. in Hayek, Prodr. Fl. Balc. 2, 347 (1930).

Prov. *Denizli* (*Caria*): Baba Da. (Cadmus) above Kadiköy, 1,700 m., schistose slopes, 23 Aug. 1950, Davis 18431 and Heywood.—Det. Ronniger,

Thymus Tosevii Vel. in Sitz. Bohm. Ges. Wiss. 1903 (28) 15 (1903).

Prov. *Izmir*, distr. *Ödemiş* (*Lydia*): Boz Da. (Tmolus), near Bozdağ, 1,200 m., slopes, 15 Aug. 1950, Davis 18175 and Heywood.—Det. Ronniger,

Ziziphora taurica DC. subsp. **cleonioides** (Boiss.) Davis, comb. et stat. nov.
—*Z. cleonioides* Boiss., Diagn. Pl. Or. Ser. 1 (5) 14: 1844.

Prov. *Denizli* (*Caria*): Baba Da. (Cadmus), 1,200 m., white-flowered form commoner than the lavender one, 23 Aug. 1950, Davis 18424 and Heywood.

Prov. *Izmir*, distr. *Ödemiş* (*Lydia*): Boz Da. (Tmolus), 1,200 m., schist slopes, fl. lilac, 16 Aug. 1950, Davis 18176 and Heywood; *ibid.*, 16 Aug. 1950, Davis 18239 and Heywood (shade form—chance seedling on stream bank).

Having examined the type of *Z. cleonioides* Boiss.—based on Boissier's gathering from Mesogis in Lydia—as well as additional Turkish material, I have little hesitation in reducing this taxon to a subspecies of *Z. taurica* DC. The latter was originally described from the Crimea, but is also fairly widely distributed in Anatolia, though scarce in the West where it is largely replaced by *Z. cleonioides*. It is evident that the type of *Z. cleonioides* is an extreme and luxuriant form of this taxon; indeed, Bornmüller's gathering from the *locus classicus* represents what appears to be the common form of this plant on Tmolus and Cadmus. Intermediates undoubtedly occur (*Balansa* 389 from near Smyrna shows a remarkable range of leaf variation), but in the main the two forms seem sufficiently distinct, both in morphology and distribution,

to justify the recognition of *cleonioides* as a subspecies of *Z. taurica*. I have not seen the plant described by O. Schwarz as *Z. cleonioides* var. *polytricha* (in Fedde, Repert. 36, 136: 1934).

It is worth noting that on Tmolus subsp. *cleonioides* is violet-flowered except for very rare white-flowered variants. But on Cadmus the position is reversed, the white form being dominant.

SCROPHULARIACEAE

Celsia cilicia Boiss. et Heldr. in Boiss., Diagn. Pl. Or. Ser. I (12) 30 (1853).

Prov. Niğde, distr. Ulukışla (Cilicia): near Alihoca at N. foot of Bulgar Da., on sunny igneous slopes, biennial, corolla golden, filaments violet, 3 Aug. 1949, Davis 16525 (*locus classicus*).—Det. Huber-Morath.

Celsia horizontalis Moench, Meth. 448 (1794).

Prov. Antalya, distr. Alanya (Pamphylia): Alanya, on walls, 23 Aug. 1947, Davis 14489.

Celsia pyroliformis Boiss. et Heldr. in Boiss., Diagn. Pl. Or. Ser. I (12) 28 (1853).

Prov. Konya (Lycaonia): between Konya and Kayacik, in dryish slightly saline marshes, perennial, leaves glaucescent, corolla yellow, filaments orange, 6 Sept. 1947, Davis 13598; between Konya and Kaşınhan, in *Juncus* marsh, 6 Sept. 1947, Davis 14760.—Det. Huber-Morath.

Celsia trapifolia Stapf in Denkschr. Akad. Wiss. Wien, 50, 88 (1885).

Prov. Muğla, distr. Köyceğiz (Caria): Sandras Da. above Ağla, 1,400–1,500 m., N. slope in Black Pine forest on serpentine, 25 July 1947, Davis 13598.—Det. Huber-Morath.

Digitalis L.

All determinations and commentaries on the species have been made by V. H. Heywood. A revision of the Turkish species of *Digitalis* has been prepared by him, containing full notes on the undermentioned gatherings. It is hoped that this will be published at an early date.

Digitalis cariensis Boiss. ex Jaub. et Sp., Ill. Pl. Or. 5 t. 409 (1853) in nota ad *D. orientalem*; Boiss., Diag. Pl. Or. Ser. 2 (3) 159 (1856), cum descript. ampl.; var. *cariensis* (var. *glandulosa* Bornm. in Beih. Bot. Centralbl. 24, 2: 1909).

Prov. Muğla, distr. Fethiye (Lycia): Baba Da. at Akbel Y., Aug. 1947, Davis 13679 and 13691. Prov. Antalya, distr. Kemer (Lycia): Tahtali Da. near Çukur Y., 1,500 m., Aug. 1947, Davis 14211; between Penirlik Y. and Gurleyik Y., in Cedar forests, perennial, flowers pale yellowish-brown with dirty white lip, 1,600 m., 10 July 1949, Davis 15113; between Kuzdere Y. and Gurleyik Y. in Cedar forest, 8 July 1949, Davis 15117; between Çukur Y. and Kuzdere in *Cedretum*, 1947, Davis 14184; Teke Da. near Ovacik in *Pinetum Brutiae*, 1,100–1,200 m., 27 July 1949, Davis 15166; Sivri Da., in Pine woods, perennial, 1,300–1,400 m., 16 July 1949, Davis 15375. Prov.

Isparta, distr. *Sütçüler* (*Pisidia*): Dedegöl Da., between Selköşe and Oruz Gaz Y., metamorphic rocks in Black Pine forest, lip off-white, 1,200–1,400 m., 1 Aug. 1949, Davis 15915. *Prov. Konya*, distr. *Ermenek* (*Cilicia Trachea*): Hamitseydi Boğ. near Sarıvadi, in *Abies* forest, 16 Aug. 1949, Davis 16239. *Prov. Mersin*, distr. *Gülnar* (*Cilicia Trachea*): between Gökbelen and Gülnar, under *Quercus* sp. (No. 16350), in fruit, 20 Aug. 1949, Davis 16351.

Digitalis cariensis is entirely West-Anatolian in distribution. K. H. Rechinger's records of it from the Aegean (Ikaria) refer to *D. leucophaea* Sibth. & Sm. Bornmüller's var. *glandulosa* is in no way distinct from var. *cariensis*: its author appears to have been misled by the somewhat inaccurate descriptions of *D. cariensis* given by Boissier (Diag. and Fl. Or.). *D. Heldreichii* Jaub. and Sp. is likewise indistinguishable from *D. cariensis* var. *cariensis* according to an isotype in Herb. Mus. Brit.

In contrast with *D. orientalis* to which it is closely related, *D. cariensis* is essentially a woodland species.

Digitalis Davisiana Heywood in Journ. Roy. Hort. Soc. 74 (4) 164 (1949).

Prov. Antalya, distr. *Alanya* (*Isauria*): Kargı Ça., between Durbanas and Derince D. (N.E. of Alanya), c. 1,000 m., in Black Pine forest, flowers pale yellow netted inside with orange-brown, perennial, 24 Aug. 1947, Davis 14401 (*holotypus* in Herb. Kew.; *isotypus* in Herb. Edin.); between Kargı Ça. and Belister (N.E. of Alanya), 26 Aug. 1947, Davis 14324. *Prov. Isparta*, distr. *Sütçüler* (*Pisidia*): Dedegöl Da. between Selköşe and Oruz Gaz Y., in Black Pine forest, 1,300 m., 1 Aug. 1949, Davis 15925; Dedegöl Da. below Çumurluk Y., 1,400–1,600 m., in Black Pine forest, inflorescence very glandular, 4 Aug. 1949, Davis 16079. *Prov. Mersin*, distr. *Anamur* (*Cilicia Trachea*): Olucak above Kükür, between Anamur and Ermenek, in Cedar forests, 18 Sept. 1949, *vidit* Davis.

Since its original discovery in 1947, further collections of *D. Davisiana* have confirmed its specific distinctness. It is now in cultivation in several gardens in Great Britain, and forms an attractive plant in flower. As will be observed above, the range of *D. Davisiana* has been considerably extended by Davis's 1949 gatherings, and Dr. Huber-Morath (*in litt.*) informs us that he collected it on his Anatolian expedition of 1948.

D. Davisiana appears to be restricted ecologically to woodlands—Pine or Cedar forests—and ranges in altitude from 1,000–1,600 m.

Digitalis ferruginea L., Sp. Pl. 622 (1753).

Prov. Bursa (*Bithynia*): Ulu Da. near hotel in *Juniperetum nanae* and *Abietum Bornmuellerianae*, c. 1,700 m., 12 Sept. 1947, Davis 14792. *Prov. İzmir*, distr. *Ödemiş* (*Lydia*): Boz Da. (Tmolus), by stream in *Castanetum*, 15 Aug. 1950, Davis 18181 and Heywood. *Prov. Denizli* (*Caria*): Baba Da., 1,500–1,700 m., 23 Aug. 1947, Davis 18437B and Heywood; above Kadıköy with *Marrubium globosum*, 24 Aug. 1950, Davis 18376 and Heywood; distr. *Acipayam* (*Caria*), Boz Da. above Geyran Y., c. 2,000 m., 16 July 1947, Davis 13421. *Prov. Muğla*, distr. *Fethiye* (*Lycia*): Girdev Da. (Eren Da.) at Bel Y., 1,900 m., 6 Aug. 1947, Davis 13802. *Prov. Antalya*, distr. *Kemer* (*Lycia*): Tahtali Da. near Çukur Y., c. 2,000 m., 17 Aug. 1947, Davis 14157—*forma foliis manifeste pubescentibus, capsulis magnis*; Tahtali Da. near Gürleyik Y., 10 July 1949, Davis 15090; distr. *Gebiz* (*Pisidia*), Bozburun Da. between Taşlı Y. and

Kozlu D., 1,600 m., 27 July 1949, Davis 15724, and near Taşlı Y., 26 July 1949, Davis 15599; *distr. Alanya (Isauria)*, N. foot of Ak Da. (S. of Geyik Da.), among rocks, 2,000 m., 30 Aug. 1947, Davis 14651, and Han Boğ. forest on Geyik Da., 30 Aug. 1947, Davis 14646. *Prov. Isparta, distr. Sütcüler (Pisidia)*: Dedeğöl Da. at Oruz Gaz Y., slopes, 1,700 m., 1 Aug. 1949, Davis 15394. *Prov. Adana, distr. Bahçe (Amanus)*: Dildil Da. between Başkonuş Y. and Husseyin Oluk Y., 27 Aug. 1949, Davis 16399; *ibid.*, above Atlik Y., 2,000–2,500 m., 27 Aug. 1949, Davis 16422.

Digitalis ferruginea shows a certain amount of variation in leaf-shape, indumentum and floral characters; but although certain variants have been described (e.g. *D. brachyantha* Griseb., *D. Pichleri* Huter, *D. aurea* Lind.) they all lack constancy and are of no taxonomic significance. Although the typical plant is glabrous or glabrescent with a small degree of pubescence on the undersurface of the leaves, paramorphs with a marked glandular pubescence on both surfaces of the leaf are not infrequent in nature.

Characteristically *D. ferruginea* is a species of woodland and open habitats ranging from 200–2,500 m. in altitude and attaining ecological optimum in montane and subalpine regions.

***Digitalis orientalis* Lam., Encyc. Bot. 2, 280 (1786).**

Prov. Ankara (distr. Beynam): Beynam, S. of Ankara, shaley slopes, fl. whitish, 5 July 1947, Davis 13071.

Despite a number of records of *D. orientalis* from the Aegean and Balkan Peninsula, *D. orientalis* appears to be endemic to Northern and North-Central Anatolia. Most false records are due to confusion with *D. lanata* Ehrh.

D. orientalis is predominantly a steppe species with an altitudinal range of 800–2,000 m. It contrasts with the essentially woodland *D. cariensis*.

***Euphrasia drosocalyx* Freyn in Catal. Soc. Helv. 1885, 9 (1885).**

Prov. Bursa (Bithynia): Ulu Da., 1,700 m., by stream on granite, 12 Sept. 1947, Davis 14800; *ibid.*, grassy places by streams near the hotel, 1,700 m., 12 Sept. 1947, Davis 14785.

***Euphrasia pectinata* Ten., Fl. Nap. Prodr. p. xxxvi (1811).**

Prov. Denizli (Caria): Baba Da. above Kadiköy, 1,500 m., N. schist bank by stream, fl. white, 23 Aug. 1950, Davis 18440 and Heywood.

***Euphrasia salisburgensis* Funk apud Hoppe in Bot. Taschenb. 1794, 190 (1794).**

Prov. Bursa (Bithynia): Ulu Da., 2,200–2,500 m., in granite and limestone screes, leaves purplish, fl. violet, 13 Sept., Davis 14831 (*forma corolla solum* 3 mm. *longa*).

Though fairly widespread in the Balkans, the species is apparently new for Asia.

***Euphrasia tatarica* Fischer in Sprengel, Syst. Veg. 2, 777 (1825).**

Prov. Ankara, distr. Beynam (Galatia): Beynam woods, by a stream on shale, 5 July 1947, Davis 13044.

Euphrasia Willkommii Freyn in Flora, **61**, 681 (1884).

Prov. Antalya, distr. Alanya (Isauria): Sobiçimen Y. at N. foot of Geyik Da., 2,000 m., edge of stream, 1 Sept. 1947, Davis 14680 (*forma foliis glaberrimis*).

Despite its glabrous leaves, I have included the gathering in this taxon which was collected on the same mountain by Heldreich. My material matches Heldreich's plant closely, except that in the latter the leaves are somewhat hirsute. More material is required of *E. Willkommii* before one can decide if the Anatolian plant is really conspecific with that from the Iberian Peninsula, as Wettstein (Monogr. Euphrasia, 166: 1896) maintains.

Gratiola officinalis L., Sp. Pl. 17 (1753).

Prov. Antalya, distr. Elmali (Lycia): Kara Go. near Yuva, 1,000 m., marshy fields, fl. white, 7 Aug. 1947, Davis 13915.

Odontites Aucheri Boiss., Diagn. Pl. Or. Ser. 1 (4) 74 (1844).

Prov. Denizli (Caria): Baba Da. above Kadiköy, limestone scree, fl. yellow, 23 Aug. 1950, Davis 18400 and Heywood. *Prov. Muğla distr. Köyceğiz (Caria)*: Sandras Da., 2,200 m., 23 July 1947, Davis (*sine num.*); *ibid.*, between Gökce Ov. and summit, 1,700 m., 23 July 1947, Davis 13506; *distr. Fethiye (Lycia)*, Baba Da. above Akbel Y., 1,800 m., 30 July 1947, Davis 13658, and Girdev (Eren) Da., 2,000 m., 6 Aug. 1947, Davis 13795. *Prov. Antalya, distr. Kemer (Lycia)*: Tahtali Da., 2,200 m., fl. yellow, 14126B. *Prov. Konya, distr. Bozkır (Isauria)*: S. Karance D., between Geyik Da. and Bozkır, 1 Sept. 1947, Davis 14607.

Odontites glutinosa (M.B.) Benth. in DC. Prodr. **10**, 549 (1846).

Prov. Konya, distr. Bozkır (Isauria): S. Karance D. between Geyik Da. and Bozkır, corolla flavous, 1 Sept. 1947, Davis 14623.

Pedicularis comosa L. var. **Sibthorpii** (Boiss.) Boiss., Fl. Or. **4**, 492 (1879).

Prov. Bursa (Bithynia): Ulu Da., limestone scree, 13 Sept. 1947, Davis 14861 (*locus classicus*).

Scrophularia L. All determinations and accompanying commentaries have been made by V. H. Heywood. In addition to Davis's gatherings, a certain amount of other collectors' material has been cited where pertinent.

Scrophularia Ballsii Heywood, sp. nov. (Sect. *Ceramanthe* Reichb.).

Ex affinitate *S. Kotschyanae* Boiss. sed statura plerumque minore (c. 20–25 cm.), foliis minoribus raro cordatis, floribus majoribus (usque 12 mm. longis), colore corollae, calycis laciniis saepe glanduloso-pubescentibus recedit.

Biennis; caules fistulosi, subtortuosi, ascendentes, 15–25 (35) cm. alti, glanduloso-pubescentes vel lanati, non vel raro ramosi. Folia late ovata 3 cm. longa, 3 cm. lata, inferiora ± longe petiolata, superiora breviter petiolata vel subsessilia, margine acute inciso-dentata lobis apice 3-dentatis, basi rotunda cuneata vel rarius cordata, venis reticulato-anastomosantibus, supra pilis brevibus apice glandulo minuto munitis pubescentia, infra pilis glandulosis cum pilis longioribus eglandulosis intermixtis, textura tenui. Cymae

ex axillis fere omnibus ortae, 2-5-florae, pedunculis longis tortuoso-ascendentibus, glanduloso-pubescentibus inflorescentiam longam atque laxam formantes. Bractae parvae ovatae vel ovato-lanceolatae; bracteolae minimae. Pedicelli longe stipitato-glandulosi calyce multoties longiores. Calycis lacinae 3-4 mm. longae, 2-2.5 mm. latae, emarginatae, aut glabrae aut saepe glanduloso-pubescentes, ovato-oblongae, obtusissimae. Corolla glabra, magna, usque ad 12 mm. longa, 6 mm. lata, pallide aurantiaco-suffusa, ore subcontracto. Stamina exserta filamentis parce stipitato-glandulosis. Appendix nulla. Capsula glabrescens vel glanduloso-pubescent, ovato-rotundata, obtusa apice \pm mucronata.

Prov. Trabzon, distr. Maçka (Pontus): Kara Kapan, 2,400 m., flowers soft-flushed apricot, leaves slightly hairy, habit 6 inches tall, growing in sheltered crevices in non-lime rocks, 6 June 1933, E. K. Balls B 355 (*holotypus* in Herb. Edin.; *isotypus* in Herb. Kew.).

S. Ballsii finds its nearest relation in *S. Kotschyana* from which it is easily distinguished by its smaller stature, much larger flowers which were described as soft-flushed apricot in colour, and by its leaves which are smaller, rounded or cuneate but rarely cordate. In addition the calyx is often glandular-pubescent and the capsules occasionally glabrescent.

Scrophularia candelabrum Heywood, sp. nov. (Sect. *Tomiohyllum* Benth. Subsect. *Oppositifoliae* Boiss. Ser. *Perennes* Boiss.); affinis *S. subaphyllae* Boiss. sed habitu candelabro-ramoso, appendice reniformi statim dignoscitur; a *S. depauperata* Boiss. habitu candelabro-ramoso, foliis minoribus angustioribusque, floribus minoribus, appendice late reniformi recedit.—Species habitu peculiari ramis divaricatis candelabrum formantibus donato distincta.

Perennis, sesquipedalis, glaberrima. Caules robusti plures e collo lignoso erecti, \pm acute quadrangulares, obsolete striata, tantum a basi usque ad tertiam partem divaricato-ramosi, ramis oppositis vel suboppositis ascendentibus incurvis virgatis rigidis candelabrum formantibus. Caules a parte inferiore in thyrsum aphyllum longum atque laxum abeuntes. Folia sparsa, opposita, pinnatifida vel pinnatisecta vel \pm lyratim pinnatilobata, laciniis vel lobis tenuibus regulariter vel irregulariter formata, interdum serratodentata; inferiora aut longe aut breviter petiolata, petiolis usque 2 cm. longis, superiora petiolis 2.5 mm. longis vel subsessilibus; lamina 1.5-4.0 cm. longa, 0.4-1.0 cm. lata, lobis laciniisque acutis vel obtusis, integris vel varie lobulatis aut dentatis; folia e nodis ramorum axillarium abortivorum 2-4 emissa parva, formae foliorum caulium subsimilia sed minora. Folia inferiora bene composita sed superiora varie reducta sunt. Folia floralia parva 2-4 mm. longa lanceolata, integra vel lobata; bractae bracteolaeque minimae squamiformes. Inflorescentiae caulis glaberrimus, superne glandulis sessilibus sparsim obsitus; cymae alternatae 1-5-florae pedunculis 1.5-2.5 cm. longis parce glandulosis, pedicellis 0.5-0.75 cm. longis sparsim glandulosis calyce 2-3-plo longioribus. Calycis lacinae ovato-orbiculatae 2.0-3.0 mm. longae, 1.5-2.5 mm. latae, glabrae, eglandulosae, albo-marginatae. Corolla extra glabra, c. 4.5-5.0 mm. longa, 3.5-4.0 mm. lata, purpureo-brunnea, staminibus breviter vel sub-exsertis, filamentis stipitato-glandulosis. Appendix \pm reniformis, libera. Capsula glabra sphaerica manifeste apiculata, 3.5-4.0 mm. longa, 4.0-5.5 mm. lata, calyce 3-plo longior.

Prov. Antalya (Lycia): Çalbalı Da., rocks, perennial, flowers dark reddish

brown, 2,000–2,100 m., 14 July 1949, Davis 15293 (*holotypus* in Herb. Kew.; *isotypus* in Herb. Edin.).

It is not easy to decide upon a precise affinity for *S. candelabrum*. Probably its closest ally is the Persian *S. subaphylla* Boiss.; among the Anatolian species, *S. depauperata* Boiss. is the nearest relative. The differences from these species are given in the diagnosis above.

The specific epithet of *S. candelabrum* refers to its curious habit: lateral branches, themselves unbranched, come off the main stem (almost from the base) in a regular fashion, ascending and slightly incurved so as to form a distinct candelabrum.

Scrophularia canina L. var. **floribunda** (Boiss. et Bal.) Boiss., Fl. Or. 4, 419 (1897).

Prov. Denizli (*Caria*): between Denizli and Tas Ocağı, 13 July 1947, Davis 13231.

Scrophularia catariifolia Boiss. et Heldr., in Boiss., Diag. Pl. Or. Ser. 1 (12) 36 (1853), (*S. nepetaefolia* Boiss. et Heldr. in Boiss., Fl. Or. 4, 407 (1879), *nom. in syn.*).

Prov. Konya, distr. Ermenek (*Isauria*): Oyuklu Da. near Kaya Pinari Çe., 1,800–1,900 m., N. cliffs, rare, perennial, 14 Aug. 1949, Davis 16165.

Comparison with an isotype of *S. catariifolia* shows the appendix to be slightly different in shape (ovate-reniform not spade-shaped), but otherwise it is a good match. The calyx lobes are densely glandular-pubescent; Boissier notes of *S. catariifolia* (Fl. Or. l.c.) “. . . inter affines calyce glanduloso insignis.”

S. catariifolia is known from the type-gatherings only, as far as I can ascertain: it was collected in Lycaonia (Karadagh, in the ruins of an old church), growing with *S. cryptophila* Boiss. et Heldr.; no fruiting material was found. There is a specimen in the Kew Herbarium collected by Kotschy (Iter Cilic-Kurd. 1859 No. 517) determined by Boissier as *S. catariifolia*, but it is not mentioned in Fl. Orientalis nor is it listed in the enumeration of *exsiccata* in the Supplement. Indeed Boissier gives no description of the fruit. The calyx of Kotschy's specimen is glabrous!

Scrophularia cilicica Heywood, sp. nov. (Sect. *Tomiophyllum* Benth.); affinis *S. catariifoliae* Boiss. et Heldr. sed foliis minoribus magis acute profunde atque irregulariter inciso-dentatis, floribus minoribus, inter alia recedit. Var. *cilicica* glabritie, laciniis calycis paulum glandulosis longius divergit. *S. libanotica* quae similis est, foliis angustioribus regulariter et leniter inciso-dentatis, pedunculis pedicellisque tenuioribus eglandulosis, calyce glabro, appendice ovata remouetur.

Perennis, chasmophytica; e basi lignosa caules numerosi ascendentes simplices vel paullum ramosi. Planta glabra vel pubescenti-glandulosa. Caules quadrangulares vel subquadrangulares 25–40 cm. alti. Folia opposita petiolata (petiolis 1.2 mm. latis, inferioribus usque 1.3 cm. longis), lamina 1.5–2.5 cm. longa, 1.0–2.5 cm. lata, ovata, basi truncata vel subrotunda vel subcordata, irregulariter acute vel obtuse crenato-dentata (saepè duplicatim), lobis mucronatis, textura subcoriacea. Inflorescentia terminalis brevis (usque ad 14 cm. longa); pedicelli atque pedunculi glandulis stipitatis

numerosis muniti. Pedicelli crassi, calyce sesquilingiores vel subaequales vel cymis reductis multum longiores. Cymae 3-5-florae, interdum ad 1-floram in reductae. Bractae lanceolatae vel lineares. Bracteolae minimae. Calycis laciniae ovato-orbiculares glabrae, c. 2.5 mm. longae, paullum vel densius stipitato-glandulosae, albido-scarioso-marginatae. Corolla extus glabra vel glandulis perpaucis munita, 0.7 mm. longa, 0.4 mm. lata, fusco-virens in sicco, lobis superioribus manifeste productis. Appendix spadiciformis, 2 mm. longa, 1.3 mm. lata. Capsula glabra orbiculata, spiculata, c. 3 mm. longa, calyce paulum longior.

Varietates duae observantur:

var. **cilicica**, planta tota glabra; laciniae calycis paullum et breviter stipitato-glandulosae.

Prov. Mersin, distr. Anamur (Cilicia Trachea): between Çamurlu Y. and Olucak (Ermenek-Anamur), 2,000 m., perennial, vertical rocks, 18 Aug. 1949, Davis 16298 (*holotypus* in Herb. Kew.; *isotypus* in Herb. Edin.).

var. **pubescens** Heywood, var. nov., folia breviter glanduloso-pubescentia; caules glandulosi; laciniae calycis glandulis stipitatis \pm dense praeditae.

Prov. Mersin, distr. Anamur (Cilicia Trachea): Çamurlu Y. between Ermenek and Anamur, 2,100 m., perennial, vertical rocks, woody base, 5 Aug. 1949, Davis 16257 (*holotypus* in Herb. Kew.; *isotypus* in Herb. Edin.).

The two gatherings of Davis on which this new species is based are essentially glabrous and pubescent paramorphs of the same species.

The affinities suggested are *S. libanotica* Boiss., *S. catariifolia* Boiss. et Heldr. and *S. rimarum* Bornm. By the character of the appendix—in this case broader than long, more or less spade-shaped—it belongs to a different series to *S. libanotica* which has an ovate appendix. There is however a close correspondence in many features with that species, especially with the specimens of the conspecific *S. nitida* Richt. collected by Pichler on Mount Karaghan. The following differences have been established to separate *S. cilicica* Heywood from *S. libanotica*: leaves rather broader, irregularly and deeply incised dentate, inflorescence with less regularly branched cymes, pedicels and peduncles thicker and glandular, calyx slightly or more densely glandular, upper lip of corolla noticeably produced beyond the lower, and appendix shape. Davis 16257 is further distinguished by its pubescence.

Typical *S. cilicica* is distinguished from *S. catariifolia* by its smaller flowers, smaller more deeply and irregularly incised leaves, slightly glandular calyx and general glabry. Var. *pubescens* Heywood differs in the same characters except that the whole plant is glandular-pubescent, but the terminal glands of the trichomes are much larger than in *S. catariifolia*.

The third putative affinity—*S. rimarum* Boiss.—is not a well-understood species (*v. infra*). *S. rimarum* var. *rimarum* (var. *farinea* Bornm. *passim*) is far removed from the new species by its dense papillose-farinaceous indumentum. *S. rimarum* var. *pubescens* Bornm. differs from the pubescent form of *S. cilicica* by its shorter trichomes tipped with minute glands. *S. rimarum* var. *glabrescens* Bornm. differs from the glabrous (typical) form of *S. cilicica* by its eglandular calyx. Both forms of the new species are further differentiated from *S. rimarum sensu lato* by appendix shape, smaller fruits and taller stature.

Scrophularia cryptophila Boiss. et Heldr., in Boiss., Diag. Pl. Or. Ser. I (12) 31 (1853).

As will be noted below, certain of Davis's gatherings are intermediate in some respects between *S. Kotschyana* Benth. and *S. cryptophila*. The specific distinctness of these two taxa is open to some doubt; indeed not all the differential characters given by Boissier to distinguish them hold true in the material cited by him. An investigation of the representatives of these two species in the Kew, Edinburgh and Cambridge Herbaria was made. From a tabulation of the more important putative differential characters the following conclusions were drawn.

The most useful and constant features which can be used to separate *S. cryptophila* and *S. Kotschyana* are as follows. In *Kotschyana* the capsule is glandular-pilose, in *cryptophila* it is glabrous. This generally holds true although intermediates occur. The inflorescence of *Kotschyana* is erect, somewhat lax and elongate; that of *cryptophila* is spreading, compact and short. Leaf dentation (acute versus obtuse) is not a reliable character—even in isotypes! Bract-size is a difficult and unreliable diagnostic. There is no constant difference in calyx shape; it may be noted that the calyx segments may be slightly glandular-puberulous in both species, although typically glabrous, and occasionally in *cryptophila* they are somewhat acute. It has not been possible to evaluate the supposed flower-size differences.

As a result it seems that one is justified in maintaining *S. cryptophila* and *S. Kotschyana* as separate species. Their geographic ranges, as at present known, are distinct although overlapping to some extent.

var. **cryptophila**.

Prov. Ankara (Galatia): Kubrus gorge near Kayaş, ledges of shady rock under *Corylus*, very local, viscid, 6 July 1947, Davis 13134; Constantinople, *sine loco*, Lady Lister. *Prov. Konya, distr. Karaman (Lycania)*: in cacumine montis Karadagh, 1845, Heldreich sub *S. Kotschyana* Benth. (*syntypus*!). *Phrygia*: Sultandagh in jugis alpinis supra Engeli, 1,850 m., Bornmüller, Iter Anatol. Ter. 1899 No. 5364. *Cilicia Trachea*: Halbdunkhe Houlen am Lamas flusse b. Maru, 600 m., June 1909, Siehe 119. *Prov. Antalya (Pisidia)*: Bozburun Da. above Tuzlu Çukur Y., foot of a N. cliff, flowers pale greenish-red, perennial (?), connected with goat droppings, 25 July 1949, Davis 15630; *distr. Elmalı (Lycia)*, in fissuris rupium reg. alpina montis Elmalı, 26 maio, 1860, Bourgeau 176.

Davis's No. 15630 is intermediate in some respects between *S. cryptophila* and *S. Kotschyana*; the leaves are more typical of the latter, i.e. acutely incised-dentate. No. 13134 is a collection in fruit with acutely dentate leaves, the calyx ovate \pm acute, and the capsules rather more acute than usual.

Scrophularia cryptophila forma.

Prov. Muğla, distr. Fethiye (Lycia): Girdev Göl by ruins, 1,670 m., 4 Aug. 1947, Davis 13754.

This gathering probably represents a form of *S. cryptophila*: it has suffered in the press and consequently it is difficult to obtain an accurate idea of its leaf shape. The leaves appear to be smaller and more ovate than in var. *cryptophila* and the leaf base is often cuneate, occasionally subcordate but seldom cordate. The calyx lobes are ovate-cuspidate \pm acute (not ovate-oblong \pm obtuse), and very slightly marginate. And the capsules are less

obtuse than in typical *cryptophila*. The following characters may be noted: no appendix, stamens exserted, corolla c. 7 mm. long with the lips equal in length, capsule \pm glabrescent, ovate-acutish, leaves \pm obtusely dentate. It also shows considerable resemblance to some broad-leaved forms of *S. bosniaca* Beck, but, *ceteris exclusis*, No. 13754 is distinguished by the absence of an appendix.

Scrophularia aff. ***S. cryptophila*** Boiss. et Heldr., capsulis acutis, pedicellis fructiferis valde recurvis.

Prov. Muğla, distr. Fethiye (Lycia): Kara Tape near Seke Y. just above Düğür, among shady rocks, 3 Aug. 1947, Davis 13886; Girdev (Eren) Da. among shady rocks, flowers dirty yellow marked with brown above, 2,000 m., 5 Aug. 1947, Davis 13867.

These two collections are in fruit and are conspecific. They probably represent a new species related to *S. cryptophila* with which they agree in general facies but differ notably in possessing ovate-acute capsules and markedly recurved pedicels. As there are no flowers for examination it cannot be stated definitely if the plants belong to Sect. *Ceramanthe* Reichb. A close relationship exists between this section and some members of the *Scorodonia* section (e.g. *S. aestivalis* Griseb., *S. peregrina* L.).

Scrophularia depauperata Boiss., Diag. Pl. Or., Ser. 1 (4) 68 (1844).

Prov. Izmir, distr. Ödemiş (Lydia): Boz Da. (Tmolus), N. slopes, rocky, 1,900–2,000 m., 16 Aug. 1950, Davis 18204 and Heywood.

The gathering agrees well with the isotype in the Kew Herbarium.

Scrophularia epicalycina Heywood, sp. nov. (Sect. *Scorodonia* Don).

Ex affinitate *S. umbrosae* Dumort. sed foliis leniter crenato-serratis, forma appendicis aliena (integra, transverse multo magis latiore), inflorescentia magis divaricata, pedicellis glabris, staminibus subexsertis, inter alia distinguitur. Ab affine *S. divaricata* imprimis glabritie, foliis non acute lobatis dentatisque, appendice haud reniformi, capsula calyce sesqui-duplo longiore, staminibus subexsertis removetur.

Planta tota glabra. Pars basalis ignota sed probabiliter bi-tri-pedalis. Caulis quadrangularis acute alatus, divaricato-ramosus, ramis inflorescentia longa atque laxa terminatis. Folia petiolata, opposita, c. 4.5–8.0 cm. longa, 2.5–4.0 cm. lata, utrinque glaberrima; ovata, acuta vel subobtusata, basi rotunda vel cuneata (anguste vel latius) vel inferiora etiam cordata, margine parce crenato-serrata (interdum duplicatim) saepe ad basin et ad apicem integra. Folia floralia lanceolata \pm integra. Bracteolae lanceolatae vel lineari-lanceolatae. Inflorescentia \pm aphylla elongata. Cymae divaricatae 3–8-florae ex axillis, pedunculis 8–16 mm. longis suffultae; pedicellis tenuibus glabris plerumque pedunculis aequilongis atque calyce 3–4-plo longioribus. Calycis laciniae \pm orbiculatae 2.5–3.0 mm. longae, 2 mm. latae, glabrae margine angusto albido paulum lacerato-denticulato; ad basin calyx plerumque bracteolis forma epicalycis praedita. Corolla glabra purpurascens-virens in sicco, staminibus subexsertis, c. 5–6 mm. longa calyce duplo longior. Appendix sat magna, transverse 3-plo latior quam alta, libera, integra. Capsula glabra, ovato-globosa apice acuta apiculata calyce sesqui-duplo longior.

Prov. Konya, distr. Ermenek (Cilicia Trachea): Göksu deresi between Ermenek and Sarivadi, by water, 15 Aug. 1949, 600 m., Davis 16209 (*holotypus* in *Herb. Kew.*; *isotypus* in *Herb. Edin.*).

A curious new species with a delicate inflorescence of the type found in *S. lateriflora* Trautv. and strange bract-like structures forming a sort of epicalyx. The exact nature of the epicalyine structures is not known: they can be seen with the naked eye and are not present in all flowers; they are a quarter to a third as long as the calyx and appear to be adnate—at least they are not detachable. The whole plant is glabrous and the pedicels are eglandular. The appendix shape is unusual—very elongate in the transverse direction and entire instead of bilobed or emarginate.

***Scrophularia Heldreichii* Boiss., Diagn. Pl. Or. Ser. 2 (3) 158 (1856), e descript.**

Prov. Isparta, distr. Sütçüler (Pisidia): Çimen Ov. on W. side of Sarp Da., flowers dark purple with whitish tips, 1,500 m., 28 July 1949, Davis 15802.

A biennial plant which comes into Sect. *Tomiophyllum* Benth. Subsect. *Oppositifoliae* Boiss. with ovate appendices. It agrees well with the description of *S. Heldreichii* from Pisidia and Lycia, but I have not seen any material of this to compare with it.

***Scrophularia Kotschyana* Benth. in DC., Prodr. 10, 303 (1846).**

Prov. Adana Mersin (Cilicia): ad radices parietum vallis Karli Boghas et in opacis faucim alt. 4,000–6,000 ped., Kotschy, It. Cilic. 1853, No. 24A, 43; Gusguta Thal, 1895, Siehe 227 (small immature plant, corollas rose-pink in *sicc.*, immature capsules glabrous); Taurus Ciliciae, intérieur des grottes situées dans la région alpine intérieure du Taurus, au nord défile des Portes Ciliciennes, 1855, Balansa 681; in Monte Tauro, 1836, Kotschy 376 (*isotypus* in *Herb. Kew.*); Burujuk, Gilbe Kur, 4,000 ft., limestone rocks, deep shade, flowers pink above and white below, densely hairy undersurface of leaves, 3 feet tall, 6 Jun. 1934, E. K. Balls 1260. *Prov. Amasya*: Amasia, ad rupes et speluncas montes Sogman alt. 800–900 m., 1889 Bornmüller 594. *Prov. Gümüshane (Armenia)*: in rupestribus montis Almuskas prope Baibout, Bourgeau Pl. Armeniacae 1862 ("*S. viscosae* Boiss." in *Herb. Kew.*—*nomen*).

The above records are of material of *S. Kotschyana* seen by me whilst enquiring into its distinctness from *S. cryptophila* Boiss.

The specimens collected in 1874 by Pichler in "Thracia borealis ad Philippopolin," labelled as *S. Kotschyana* Fenzl at Kew, should be referred to *S. aestivalis* Griseb. *S. Kotschyana* is endemic to Anatolia as far as is known.

***Scrophularia libanotica* Boiss., Diagn. Pl. Or. Ser. 1 (12) 36 (1853).**

In connection with the investigation of *S. cilicia* Heywood, the material of *S. libanotica* in the Kew Herbarium was examined, and as the latter was far from uniform an attempt at clarification seems desirable.

Boissier based his description of *S. libanotica* on several gatherings and designated no holotype. The following notes were made on type material represented at Kew:

Arab. Petr.: in monte St. Catherinae, Schimper 1835 sub *S. Urvilleana* Decaisne. Leaves deeply toothed, incised-lobed at the base. In fruit,

but agreeing well with Boissier's description except that the capsules are twice as long as the calyx. This is the type gathering of *S. Urvillei* Decaisne non Wydl., a synonym of *S. libanotica*. Another collection from this area—rochers humides, Montaigne St. Catherine, 1833, Bové, sub *S. heterophylla* Willd.—was examined and the appendix seen to be very small, 0.3 mm. \times 0.2 mm., oblong \pm spatulate. In Zohary's study of the phytogeography of this region* he records no other species which could be confused with *S. libanotica*. It can be concluded with reasonable certainty that Bové's plants are conspecific with Schimper's.

Syria: in monte Cassio, 1846, Boissier sub *S. heterophylla* Willd. Appendix 0.5 mm. \times 0.5 mm., hexagonal—broadly ovate. The leaves are much narrower than in the St. Catherine plants and much less deeply toothed. The inflorescence shows only a few glands and is otherwise glabrous. The inflorescence is in bud and difficult to compare, but the pedicels are probably longer in fruit than in Schimper and Bové's plants. I have chosen this specimen (in Herb. Kew) as the provisional lectotype of *S. libanotica* Boiss.

Taurus: in monte Tauro (Cilicia), 1836, Kotschy 378 sub *S. melissaeifolia*. Appendix \pm same as in the Syrian plants but larger—1 mm. \times 0.75 mm. with slightly undulate margins. The plants agree well in other respects.

Kurdistan: in glareosis regionis alpinæ montis Gara Kurdistanæ, 1841, Kotschy 316 (516 in Boiss., Diag. *sp. balm.*) ut *Scrophularia* forsan n. sp. aff. *creticæ* et *incisæ*. Agrees generally with *Taurus* and Syrian specimens. Appendix 0.65 mm. \times 0.65 mm.—more rounded than ovate.

As noted above I have chosen Boissier's gathering from Mount Cassius in Syria as the provisional lectotype of *S. libanotica*. The plants from Mt. St. Catherine, although probably conspecific with *S. libanotica*, diverge from the typical form in a few characters such as appendix shape, more glandular inflorescence and leaf-shape. Further collections would be required before a decision on the status of this paramorph could be made.

S. nitida Richter, collected by Pichler "ad Krebuterkhane in monte Karaghan (Media), 2,000 m." on his *Iter Persicum* of 1882, should be regarded as conspecific with *S. libanotica*. The leaves are less acute, the appendix is ovate, 0.6 mm. \times 0.4 mm., and the plants are shorter in stature.

S. libanotica is frequently confused with *S. heterophylla* Willd.; many specimens are so named in herbaria. The following characters serve to distinguish *S. heterophylla* from *S. libanotica*: leaves shorter, more obtuse-rounded, obtusely lobed; larger flowers; calyces more broadly margined; stamens scarcely exerted; and appendix reniform, acutish.

Their distribution is also distinct: *S. heterophylla* is a Balkan-Aegean species, while *S. libanotica* ranges from Lebanon and Palestine, Cilicia and Amanus to Persia and Kurdistan.

***Scrophularia libanotica* var. *oligantha* Heywood, var. nov.**

Cymæ simplices, reductæ, 1-2-floræ, non divaricatæ 5-9-floræ. Appendix late ovata, apice acutiuscula.

* Zohary: Sinai, die phytogeog. fl. Halb. in Beih. Bot. Centralbl., 52 B, 549 (1935).

Prov. Niğde, distr. Ulukışla (Cilicia): Taurus, reg. alp., au dessus de Boulgarmaden, 22 juillet, Balansa, Pl. d'Or. 1885, No. 679 (*holotypus in Herb. Kew.; isotypus in Herb. Edin.*).

This collection, cited by Boissier in the *Flora Orientalis*, is remarkable for the reduction of the inflorescence: the cymes have been reduced to one or two flowers so that the peduncle bears one flower on a pedicel, or one lateral branch of a cyme has developed as well to give two pedicels and two flowers (in all). The appendix is rather large, 1.5 mm. long, 1.25 mm. broad, broadly ovate, and somewhat acute at the apex. Otherwise the plants are more or less identical with the typical form.

***Scrophularia lucida* L. subsp. *filicifolia* (Mill.) Rech. fil., *Flora Aegaea*, 478 (1943), forma.**

Prov. Antalya (Lycia): between Çakırlar and Söğüt Y., near N. foot of Sivri Da., sloping rock, biennial, 300 m., 16 July 1949, Davis 15440.

A single gathering which can be accommodated in the *lucida-sphaerocarpa* group although not agreeing exactly with any member of that group. It perhaps approximates most closely to *S. lucida* subsp. *filicifolia* from which it differs slightly in the more acute dentation of the leaves, the teeth being longly mucronate, and in the more narrowly margined calyx.

Subsp. ***sphaerocarpa*** (Boiss. et Reut.) Rech. fil., *Fl. Aegaea*, 478 (1943).

Prov. İzmir, distr. Ödemiş: Boz Da. (Tmolus Lydiae), 1,200 m., 15 Aug. 1950, Davis 18174 and Heywood.

Boissier recorded *S. sphaerocarpa* Boiss. et Reut. from Boz Dağ (ancient Tmolus in Lydia) in his *Flora Orientalis* (4: 403). This gathering is in some respects intermediate between subsp. *sphaerocarpa* and subsp. *filicifolia*. The leaves are broadly and obtusely lobed with minute acuminae at the apices of the laciniae; the fruits are scarcely smaller than in subsp. *filicifolia* proper. It is probably a local modification of little value.

***Scrophularia lyrata* Heywood, sp. nov.** (Sect. *Tomiophyllum* Benth. Subsect. *Oppositifoliae* Boiss.), affinis *S. Pinardi* Boiss. et *S. xylorrhizae* Boiss. et Hausskn. habitu rupicola, rhizomate multicaule lignoso sed ab ambabus foliis minoribus lyrato-pinnatisectis, pinnis obtusis statim distinguenda. A *S. Pinardi* foliis lyratis et obtuse pinnatifidis, pedicellis ramisque cymorum brevioribus atque minus tenuibus differt. A *S. xylorrhiza* foliis obtuse divis et segmentis majoribus atque paucioribus diversa.

Perennis rhizomate permagno lignoso tortuoso 3 cm. diametro, caulibus veteribus numerosis persistentibus. Planta tota glandulis parvis sparsis obsita. Caulis subquadrangulares fere alati, fragiles, virides, 20–25 cm. alti, erecti, simplices, inflorescentia brevi pauciflora terminati. Folia opposita, ambitu ovata obtuse lyrato-pinnatifida vel profunde inciso-crenata, omnia petiolata glandulis numerosis in sulco petiolarum munita. Lamina apice obtusa, carnosula basi variabili, grosse et obtuse inciso-crenata, saepe in pinnulos obovatos obtusos, ± integros vel lobulatos, 2–4 ad basin divisa (crenis 3–9), 2.0–3.0 (3.5) cm. longa (petiolo incluso), 1.0–1.5 cm. lata, concolor, in utraque pagina subglabra, glandulis numerosis secundum venos. Folia floralia caulinis similia sed minora, summa integra lanceolata. Bracteolae lineari-lanceolatae vel lineares. Cymae 3–5-florae divaricatae (saepe irregulariter) pedunculis 6–12 mm. longis parce glandulosis suffultae.

Pedicelli dense glandulosi calyce 2-3-plo longiores. Calycis laciniae glabrae, anguste albo-marginatae 1.25-1.5 mm. longae. Corolla parva, glabra purpurea (in sicco) c. 3.5-4.5 mm. longa, calyce 3-4-plo longior, antheris exsertis. Appendix parva ovato-oblonga, libera. Capsula glabra globosa 3.5 mm. longa, obtusa, apiculata calyce 3-plo longior.

Prov. Antalya (Lycia): Söğüt Ya. near Sivri Da. (above Çakırlar), 16 July 1949, Davis 15366A (*holotypus* in Herb. Kew.; *isotypus* in Herb. Edin.).

The new species agrees in general habit with *S. xylorrhiza* Boiss. et Hausskn. and *S. Pinardi* Boiss. It is a rupestral plant with an extraordinarily large woody twisted rootstock, fragile brittle stems, and leaves resembling some species of *Quercus*. It is difficult to decide whether *S. xylorrhiza* or *S. Pinardi* is the nearer affinity, but according to the shape of the appendix the latter comes closest. *S. xylorrhiza* is a doubtful species as regards appendix shape which was described by Boissier as ovate-rotund and shown by Eig (in Pal. Journ. Bot. Ser. J, 3: 1944) to be heterogeneous, containing in addition oblong-linear types. But neither of these is like the appendix in our species.

Scrophularia myriophylla Boiss. et Heldr., in Boiss., Diagn. Pl. Or. Ser. 1 (12) 39 (1853), incl. *S. laxa* Boiss. et Heldr., in Boiss. Diagn. Pl. Or. Ser. 2 (3) 154 (1856).

Prov. Antalya, distr. Alanya: Ak Da., S. of Geyik Da., on N.W. side near little lake, 2,200-2,300 m., screes, 28 Aug., Davis 14364. Prov. Mersin, distr. Anamur (Cilicia Trachea); near Çamurlu Y., between Ermenek and Anamur, rocky slopes, rare, 2,000 m., 15 Aug. 1949, Davis 16265.

The *locus classicus* of this species was given by Boissier and Heldreich as "in regione superiori montis Gheidagh Tauri Isaurici," i.e. Geyik Dağ. Apparently the collector, Heldreich, had a fairly wide conception of the limits of Geyik Dağ as shown by other of his references to this locality, and it seems quite probable that Davis's collection from Ak Dağ comes within the type locality. In any case, Ak Dağ is only three miles from Geyik Dağ.

Boissier (Fl. Or. 4: 404) placed *S. myriophylla* next to *S. laxa* Boiss. et Heldr.—a species from the upper and alpine regions of the Peloponnesus. He says of the former species "*S. laxa* magis affinis [quam *S. Hoppii*] differt foliorum lacinii multo crassioribus, floribus duplo majoribus." Examination of the material in the Kew Herbarium breaks down these distinctions. In fact the material collected by Davis agrees more completely with some specimens of *S. laxa* than with those of *S. myriophylla*. The distinction in flower-size may hold to some extent—to be definite more material would have to be seen—but the two taxa are for practical purposes inseparable if no indication of locality is supplied. For these reasons I regard *S. laxa* as conspecific with *S. myriophylla*—the older name. There do not even seem to be sufficient characters for subspecific separation.

It should be pointed out that a close floristic relationship exists between the Taurus region and the Peloponnesus. Some examples of species pairs may be noted: *Nepeta pilinux* Davis (Isauria and Pisidia) and *N. camphorata* Boiss. et Heldr. (Taygetus); *Micromeria carica* Davis (Carian Boz Dağ) and *M. taygetea* Davis (Taygetus); *Globularia dumulosa* Schwarz (Caria and Lycia) and *G. stygia* Orphan. (Styx gorge of Chelmos). It seems not unreasonable to expect the occurrence of a single species with a disjunct range in these two areas, as is frequent in the Mediterranean flora.

Scrophularia olympica Boiss., Diagn. Pl. Or. Ser. I (4) 69 (1844), forma inter var. *olympicam* et var. *macrophyllam* Freyn et Sint. ex Bornm.

Prov. Bursa (Bithynia): Ulu Da., screes in N. cirque, 13 Sept. 1947, Davis 14854.

Although collected from Bithynian Olympus (*locus classicus*), these specimens diverge from type material in that the leaf segments are more rounded and fewer toothed, scarcely "duplicatim dentata." They seem to be intermediate between var. *olympica* and var. *macrophylla* Freyn et Sint., differing from the latter in their smaller and narrower leaves with less rounded lobes.

Scrophularia praeterita Heywood, sp. nov. (Sect. *Ceramantbe* Reichb.).

Ex affinitate *S. vernalis* L. a qua calycis laciniis minoribus angustioribus, ovato-lanceolatis, acutis vel subacutis, glabris, filamentis staminum stipitato-glandulosis, capsulis minoribus distinguitur. Ab affini *S. lunariifolia* Boiss. et Bal. pubescentia, laciniis calycis angustis lanceolatis acutis, foliis profundius dentatis, capsula glabra recedit.

Biennis (?); caules 30-50 cm. alti, fistulosi quadrangulares, crispule et dense villosi, subtortuosi ascendentes, interdum ramosi. Folia 7-9 cm. longa, 8-9.5 cm. lata, adpresse pubescentia praesertim secundum venos, petiolata (inferiora longe, superiora breviter), sed suprema sessilia, late ovata vel orbiculato-ovata cordata, textura papyracea, grosse et argute dentata (duplicatim vel triplicatim) ad marginem venis paulum anastomosantibus, venis subtus albidis. Inflorescentia longa laxa foliata. Cymae 3-8-florae ex axillis oppositis ortae, pedunculis 2-3 cm. longis ascendentibus, longe glandulosi-pubescentibus. Bractae lanceolatae; bracteolae lineares. Pedicelli stipitato-glandulosi calyce 1-2-plo longiores. Calycis lacinae parvae 2.5-3.0 mm. longae, 1.0-1.25 mm. latae, glabrae ovato-lanceolatae acutae vel subacutae. Corolla glabra 7-8 mm. longa, lobis inter se subaequalibus, ore contracto. Stamina valde exserta, filamentis stipitato-glandulosis. Appendix nulla. Capsula glabra, oblongo-ovata, acuta, apice acuminata, 6 mm. longa, 4-4.5 mm. lata.

Prov. Izmir, distr. Ödemiş (Lydia): Boz Da. (Tmolus), shady schistose caverns on N. side, 2,000 m., 15 Aug. 1950, Davis 18196 and Heywood (*holotypus* in Herb. Kew.; *isotypus* in Herb. Edin.).

It is somewhat surprising to be able to record a new species of *Scrophularia* from such a well botanised mountain as Boz Dağ in Lydia (ancient Tmolus). It already has an endemic species—*S. tmoli* Boiss.

Although the collections are in fruit, a few withered corollas were found for examination; these showed clearly absence of an appendix, thus confirming the position of the new species in Sect. *Ceramantbe* Reichb. Within that section it is allied most closely to the group of species with \pm ascendant axillary cymes (*vernalis*-*Kotschyana*-*chrysantha*), and of these is nearest to *S. vernalis* L. It is very distinct from both *S. Kotschyana* Benth. and *S. Bornmuelleri* Freyn & Sint. ex Freyn in its ovate-acute calyx, glabrous ovate-oblong capsules and shorter-peduncled cymes. The differences from *S. vernalis* are less striking: a very different calyx—ovate-lanceolate acute and glabrous, not ovate-oblong obtuse and glandular—stipitate-glandular staminal filaments and generally smaller capsules. The habitat of *S. praeterita*—shady crevices above the tree line—is quite unlike that of *S. vernalis* which

is (when native) a woodland species. Moreover *S. vernalis* does not grow in Anatolia, nor is it common in the Balkan Peninsula where Hayek (Prodr. Fl. Balc. 2, 147: 1929) gives it for Bosnia-Herzegovina and Serbia. Halácsy (Consp. Fl. Graec. 2: 1902) does not record it from Greece.

The Persian species *S. Clausii* Boiss. et Buhse which Boissier related to *S. cryptophila* Boiss. et Heldr. has been shown by Stiefelhaven to be conspecific with *S. vernalis*. He says that the specimens of *S. Clausii* are in agreement with many European paramorphs of *S. vernalis*. From the description, *S. Clausii* differs from *S. praeterita* in its glabrescent inflorescence and glandular, linear-oblong calyx.

Scrophularia rimarum Bornm., in Fedde, Repert., 7, 202 (1909) et in Beih. Bot. Centralbl. 61, 110 (1941) var. **glabrescens** Bornm., l.c.

Prov. Denizli, distr. Acipayam (Caria): Boz Da., rocks at 2,100–2,250 m., 4 July 1947, Davis 13388. Prov. Antalya, distr. Alanya: Ak Da. (S. of Geyik Da.), on N.W. side near little lake, cliffs, 2,000 m., 28 Aug. 1947, Davis 14344.

The systematic position of these paramorphs is somewhat uncertain; they were collected in fruit and are very distinctive in facies. No. 13388 closely approaches specimens in the Kew Herbarium from Iraq (Arl Gird Dag, 3,600 m., on rocks, 22 July 1932, Guest 3051), identified by Blakelock after comparison with typical material from the Herbarium Haussknecht, Weimar, as *S. rimarum* Bornm. form between var. *glabrescens* Bornm. and var. *pubescens* Bornm.; it differs mainly in its glabry. It is obvious from the material seen by Blakelock (v. Kew Bull. 1949, 553: 1950) that Bornmüller's categories (vars. *farinea*, *glabrescens*, *pubescens*) intergrade. Both of Davis's collections may be regarded as glabrous forms of *S. rimarum*, although not necessarily var. *glabrescens* as envisaged by Bornmüller. But until further gatherings of this species are made, and it is possible to separate out its variants more clearly, it seems advisable to include these Anatolian specimens under that taxon (var. *glabrescens*).

Scrophularia rupestris M.B. in Willd., Sp. Pl. 3, 274 (1800) var. **pinnatisecta** Heywood, var. nov.

Glaberrima, inflorescentia solum glandulis munitis. Caules usque 20 cm. alti. Folia plerumque pinnatisecta, interdum profunde pinnatidivisa, pinnis \pm lanceolatis profunde sectis dentibus subacutis. Inflorescentia multiflora, cymis 3–7-floris. Appendix lineari-oblonga, minima, 0.75 cm. longa.

Prov. Antalya (Lycia): Söğüt Y., near Sivri Da., 16 July 1949, Davis 15366b (*holotypus* in Herb. Kew.; *isotypus* in Herb. Edin.).

This gathering comes well within the *S. variegata*–*rupestris* complex which is well noted for its polymorphy. After examining the Kew material of these I am inclined to follow recent authors in regarding *S. rupestris* as a species distinct from *S. variegata* M.B., and not as a variety of it as treated by Boissier. The inclusion of this new variety in *S. rupestris* will give it a fuller specific range of variation.

I am uncertain of the rank to be assigned to this collection: it is typical of *S. rupestris* in facies by having a large and thick woody rootstock of considerable age with numerous old indurated stems crowding the base. But the leaves, although similar in incision or dentation to some specimens of

S. rupestris, are distinct in being pinnatisect (or pinnately divided) to the base. The leaves of *S. variegata* may be divided to the base, but Davis's gathering—a rupestral plant like *S. rupestris*—is further removed from that species, notably in habit. In addition there are the differences noted above which apply to both *S. rupestris* and *S. variegata*—glabry and appendix-shape.

The new variety agrees more closely with material of *S. variegata* from Persia, Armenia and Asia Minor than with Palestine and Syrian specimens.

Scrophularia Scopoli [Hoppe ex] Pers., Syn. 2, 160 (1807) var. **longirostrata** Heywood, var. nov.

Folia simplicia, breviter petiolata, ovata vel ovato-lanceolata, ad basin truncata, vel cuneata, concoloria, venis anastomosantibus subtus prominentibus; inferiora usque 10 cm. longa, 4 cm. lata, superiora diminuta, dentibus manifeste apiculatis inciso-crenata. Capsula glabra, ad basin ovato-globosa, apice longe attenuata, rostrata. Appendix et flores ut in forma typica.

Prov. Antalya, distr. Alanya (Isauria): Han Boğaz forest near Geyik Da. in *Abietum*, 1,580 m., 30 Sept., 1947, Davis 14710 (*holotypus* in Herb. Kew.; *isotypus* in Herb. Edin.).

When known only from fruiting material, it was at first thought that this was a new species, but plants raised from Davis's seed at the Royal Botanic Garden, Edinburgh, have emphasised its affinity with *S. Scopoli* (itself already polymorphic), of which I now consider it a new variety.

Capsules approaching var. *longirostrata* in length of beak are found in specimens of *S. Scopoli* collected by Kotschy in the Taurus (1836, No. 377). The plants have larger leaves with fewer dentations, but may be placed here.

Scrophularia Scopoli [Hoppe ex] Pers. *forma*.

Prov. Antalya, distr. Alanya (Isauria): Ak Da., S. of Geyik Da., in shady places by little lake, 2,200 m., 28 Aug. 1947, Davis 14366.

On Ak Dağ, a little to the south of the type locality of *S. Scopoli* var. *longirostrata*, and at the much higher altitude of 2,200 m. by a tarn used by shepherds to water their goats, Davis collected a *Scrophularia* related to *S. Scopoli*. The plants had been goat-eaten but a good, although somewhat dwarfed, specimen was collected in flower. I can refer it to no published variety of *S. Scopoli*, but as the material is very limited and perhaps not typical I have refrained from describing it as new. It is a glandular pubescent annual or biennial, c. 20 cm. tall, with shortly petiolate triangular-ovate leaves which are grossly and irregularly incised-dentate. The cymes are 2-4-flowered, the pedicels densely glandular, the corolla brownish-green, 7-8 mm. long with included or subexserted stamens. The appendix is obreniform with slightly divaricating lobes; the capsules (immature) ovate-globular, one and a half times as long as the calyx. The plants show a superficial resemblance to *S. Hajariana* Parsa (*typus* in Herb. Kew.) from Iran, but there is no close affinity.

Scrophularia aff. ***S. subaphyllae*** Boiss., Diagn. Pl. Or. Ser. 1 (7) 41 (1846).

Prov. Antalya, distr. Kemer (Lycia): Tahtali Da., 2,000-2,200 m., N. scree, perennial, very twiggy, flowers brownish-green, 10 July 1949, Davis 15063; *ibid.* 16 Aug. 1947, Davis 14118 (*fruct.*).

This gathering is probably of a new species related to *S. subaphylla* from

which it differs by its larger reniform appendix, brownish-green corolla, and more divaricately branched habit. *S. striata* Boiss., which resembles it, is distinguished by its less divaricate-branched habit, more striate stems, and cymes with 9-5 very shortly pedicellate flowers. It approaches *S. candelabrum* Heywood in its more or less candelabrum-branching habit, but it diverges in its more slender, fragile and numerous stems, smaller more regularly divided leaves, cymes reduced to 1 or 2 flowers, and brownish-green corollas.

Scrophularia umbrosa Dumort., Fl. Belge, 37 (1827) ut sp. nov. [*S. alata* Gilib., Fl. Lithuan. 2, 127 (1781), *nomen illegitimum*].

Prov. Izmir, distr. Ödemiş: Boz Da. (Tmolus Lydiae), shady stream bank, 1,300 m., 16 Aug. 1950, Davis 18234 and Heywood. Prov. Muğla, distr. Fethiye (*Lycia*): Girdev Da. at Bel Y., by spring, 7 Aug. 1947, Davis 13880.

No. 18234 is more or less typical, but the calyx lobes are rather narrower than usual, and the appendix is of a curious shape—much broader than long, with the upper margin lobed-undulate. Boissier notes the appendix shape as variable.

For a summary of the nomenclature of this species *vide*: Hylander, N., Nomenklatorische und systematische Studien über nordische Gefäßpflanzen in Uppsala Univ. Arsskr. 7, 280 (1945).

Scrophularia umbrosoides Heywood, sp. nov. (Sect. *Scorodonia* Don).

A *S. umbrosa* Dumort. foliis basi truncatis (neque rotundatis nec subcordatis), inflorescentia multo magis divaricata, cymis paucifloris laxis, pedicellis multum longioribus, appendice late orbiculata integra divergit.

Planta glaberrima (pedicellis exceptis). Caulis quadrangularis, acute alatus, purpurascens, c. 1.5 m. altus, laxe ramosus, foliatus, in inflorescentiam longam laxam abiens. Folia simplicia petiolata, opposita; inferiora petiolis subulatis 3.5 cm. longis suffulta, lamina lanceolata vel oblongo-lanceolata 9-10 cm. longa, 4 cm. (parte maxima) lata, basi ambitu truncata, textura tenuis, concolor, nervis infra prominentibus valde anastomosantibus, dentibus 20-30 regulariter superne diminutis submucronatis infimis manifeste reflexis crenato-dentata; superiora breviter petiolata, lamina apice attenuata, acuta. Folia floralia lineari-lanceolata, summa linearia. Cymae irregulariter divaricatae, 5-multi-florae, pedunculis glabris (inferioribus 2.5-4.0 cm. longis) suffultae. Bractae lineares aut subulatae pedicellis breviores. Pedicelli glandulosi calycibus usque 7-plo longiores, bracteolis subulatis suffulti. Calycis laciniae glabrae ovatae, 2.5 mm. longae, margine serrato-dentato albo. Corolla glabra, fusco-virens (in sicco) 6 mm. longa, 3 mm. lata, lobis superioribus ceteris sequilongioribus. Stamina vix exserta. Appendix late ovato-circulata (transverse latior) integra, basi vix subcordata. Capsula ovata, glabra, 5-6 mm. longa, breviter apiculata, calyce 2-3-plo longior.

Prov. Denizli, distr. Acipayam (*Caria*): Boz Da., near Geyran Y., by shady stream, 1,300 m., 16 July 1947, Davis 13356 (*holotypus* in Herb. Kew.; *isotypus* in Herb. Edin.).

The new species is probably most closely related to *S. umbrosa* Dumort. with which it agrees in habit and appearance, and in the winged stems. The development of the base of the lamina is a distinctive feature: the proximal teeth are markedly reflexed, giving a winged appearance almost suggesting a

subsagittate base. In inflorescence the new species differs from *S. umbrosa* in its longer spreading peduncles (of the cymes), in the individual pedicels which are six times as long as the calyx, and in its looser fewer-flowered cymes. The appendix of *S. umbrosa* is variable, normally broader than long, obcordate-bilobed with divaricating lobes, but in *S. umbrosoides* it is of a type not observed in *S. umbrosa*—broadly ovate-orbicular, entire, and scarcely subcordate at the base.

S. umbrosoides agrees with *S. divaricata* Led. in having divaricating cymes, but this feature is even more developed than in that species. *S. divaricata* differs in its obtusely winged stem which is "crispule villosus," in its membranaceous undulate leaves which are cordate at the base, and in its orbiculate widely margined calyx-segments.

S. umbrosoides is known only from the type-gathering: it was collected by a shady woodland stream in an otherwise dry locality.

Scrophularia xanthoglossa Boiss., Diagn. Pl. Or. Ser. 1 (12) 38 (1853).

Prov. Ankara: hills between Kayaş and Kubrus, 6 July 1947, Davis 13117.

Scrophularia aff. xanthoglossae Boiss.

Prov. Denizli, distr. Acipayam (Caria): Monastir Ormani between Acipayam and Abbas, open places near wadi bed in *Pinus Brutia* forest, 18 July 1947, Davis 13471.

Collection in fruit: stout virgate plant with woody base and many-flowered stems. The flowers and fruits appear to be very small. Probably a form of *S. xanthoglossa*, but as there are no corollas, few fruits and few leaves it is impossible to define more precisely. There are also affinities with *S. canina* L. (in a different appendix group).

Scrophularia xylorrhiza Boiss. et Haussk. in Boiss., Fl. Or. 4, 406 (1897).

Prov. Konya, distr. Bozkır (Isauria): Bozkır vadisi, cliffs, perennial, 1,100 m., 7 Sept. 1947, Davis 16619 (fruct.).

The gathering agrees well with *Kotschy* 100 (sub *S. Pinardi* orig. det. Boiss.) from the Cilician Taurus, cited by Boissier in Fl. Orientalis.

Scrophularia aff. xylorrhizae Boiss. et Haussk.

Prov. Muğla, distr. Fethiye (Lycia): Telmessus, rocks, 28 July 1947, Davis 13703 (fruct.).

Scrophularia sp.

Prov. Muğla (Fethiye): Baba Da. above Akbel Y., c. 2,000 m., 30 July 1947, Davis 13654.

There are no flowers and only fragmentary leaves.

Scrophularia sp. (Sect. *Tomiophyllum* Benth.).

Prov. Antalya, distr. Gëbrëz (Pisidia): Bozburun Da., above Tozlu Çukur Y., conglomerate cliff, perennial, woody base, 1,900–2,100 m., 27 July 1949, Davis 15605.

Collection in fruit which has not been matched.

Appended below is a key to the biennial species of the Sect. *Ceramanthe* Reichb. of which I have seen material.

- A. Cymes erect or ascending, \pm lax and elongate:
 - B. Capsules glabrous:
 - C. Calyx lobes ovate-oblong, obtuse, glandular *S. vernalis*
 - CC. Calyx lobes ovate-lanceolate, acute or subacute, glabrous *S. praeterita*
 - BB. Capsules glandular or glandular-tomentose:
 - D. Plants glabrous *S. lunariifolia*
 - DD. Plants papillose-glandular, hirsute, lanate or hispid:
 - E. Inflorescence of subsessile cymes forming a dense thyrses *S. chrysanthra*
 - EE. Inflorescence of longly pedunculate cymes arising from the axils of most leaves, forming a lax thyrses:
 - F. Plants procumbent or ascendant *S. Bornmuelleri*
 - FF. Plants erect:
 - G. Flowers very large, up to 12 mm. long; plants 20-25 cm. *S. Ballsii*
 - GG. Flowers large, 6-7 mm. long; plants 25-50 cm. tall *S. Kotschyana*
 - AA. Cymes spreading, \pm compact and short *S. cryptophila*

Verbascum L.

Unless otherwise indicated, the determinations of *Verbascum* and remarks accompanying the species have been made by A. Huber-Morath.

Verbascum amanum Boiss., Fl. Or. 4, 310 (1789).

Prov. Adana, distr. Bahçe (*Amanus*): Dildil Da., between Başkonuş Y. and Husseyin Oluk Çe., 1,800 m., steep gully, biennial, filaments violet, 27 Aug. 1949, Davis 16382.

Verbascum bellum Huber-Morath in Fedde, Repert. 46, 170 (1939).

Prov. Muğla, distr. Fethiye (*Lycia*): Baba Da. above Ak Bel Y., 1,700 m., scree, filaments yellow, biennial (or perennial?) with stems 0.6-1.3 m. tall, 30 July 1947, Davis 13650.

Verbascum Blattaria L. var. *brevipedicellatum* Hal. in Öst. Bot. Zeitschr. 42, 419 (1892).

Prov. Antalya, distr. Elmali (*Lycia*): Kara Go., in ditches near the lake, 7 Aug. 1947, Davis 13926.

Verbascum campestre Boiss. et Heldr. in Boiss., Diagn. Ser. 1 (12) 5 (1853).

Prov. Ankara (*Galatia*): Muhan Go. near Ankara, at edge of fresh-water lake, 5 July 1947, Davis 13073; Beynam, fallow fields, 5 July 1947, Davis 13005.

Verbascum caricense Huber-Morath in Fedde, Repert. 46, 180 (1939).

Prov. Muğla, distr. Köyceğiz (*Caria*): Sandras Da., above Ağa, 1,400 m., in *Pinus nigra* subsp. *Pallasiana* forest, 25 July 1947, Davis 13593; Sandras Da. at Gökçe Ov., biennial, leaves silvery, 23 July 1947, Davis 13529.

Verbascum cheiranthifolium Boiss., Diagn. Ser. 1 (4) 56 (1844) var. *cheiranthifolium* (var. *typicum* Murb., Monogr. *Verbascum* 276: 1933).

Prov. Antalya, distr. Kemer (Lycia): Tahtali Da. at Çukur Ya., 1,600 m., 16 Aug. 1947, Davis 14147; *distr. Alanya (Isauria):* above Gedevet Y. near Durbanas, 25 Aug. 1947, Davis 14270.

var. **asperulum** (Boiss.) Murb., Monogr. *Verbascum* 277 (1933).

Prov. Ankara (Galatia): Hacikadun valley near Kecioren, slopes, fl. small, 9 July 1947, Davis 13198; Kubrus gorge near Kayaş, biennial, 6 July 1947, Davis 13137; Beynam, dry chalky slope, 5 July 1947, Davis 13077. *Prov. Muğla, distr. Köyceğiz (Caria):* Sandras Da. near Ağla, 600 m., in burnt forest, filaments yellow, 25 July 1947, Davis 13641. *Prov. Antalya (Pisidia):* Termessus, 1,000 m., in *Quercetum*, 11 Aug. 1947, Davis 13954.

var. **Heldreichii** Boiss., Fl. Or. 4, 326 (1879).

Prov. Isparta, distr. Sütçüler (Pisidia): Dedegöl Da. near the cirque Anıç, rocky slopes, 2 Aug. 1949, Davis 16061; Dedegöl Da. near Oruz Gaz Ya., 1,600 m., perennial with several rosettes and stems, 1 Aug. 1949, Davis 15949. forma inter var. **asperulum** (Boiss.) Murb. et var. **Heldreichii** Boiss.

Prov. Muğla, distr. Fethiye (Lycia): Girdev Da. above Girdev Go., 2,000 m., perennial, several stemmed, filaments yellow, 3 Aug. 1947, Davis 13789. *Prov. Antalya, distr. Alanya (Isauria):* Ak Da. (S. of Geyik Da.) near the tarn, 2,200–2,300 m., rocky slopes, 28 Aug. 1947, Davis 14369.

Verbascum chrysochaete Stapf in Denkschr. Akad. Wiss. Wien, 50, 89 (1885).

Prov. Muğla, distr. Fethiye (Lycia): Baba Da. at Akbel Ya., 1,200 m., 30 July 1947, Davis 13699. *Prov. Antalya, distr. Gebiz (Pisidia):* Sinni Ça. (Nenni Ça.) between Gebiz and Pinargözü Y. on Bozburun Da., appearing after forest fires, 22 July 1949, Davis 15486. *Prov. Isparta, distr. Sütçüler (Pisidia):* Sarp Da. above Kuzdere, 1,100–1,300 m., 28 July 1949, Davis 15830.

Verbascum Davisianum Huber-Morath, sp. nov. (Sect. *Bothrosperma* Murb., Subsect. *Fasciculata* Murb., B. *Isandra* Franch., a. *Bracteolata* Murb., α *Umbellulifera* Murb., 1. *Adenantha* Murb.).

Species haec habitu ut in *V. pycnostachyo* Boiss. et Heldr. var. *uschakensis* Murb., sed spicis valde compactis haud interruptis, calycis lobis longioribus magis acutis, capsula elliptica, 7–9 mm. longa, 4–5 mm. lata (non subglobosa 4–5 mm. longa et lata) inter alia differt.

Planta biennis, 30–80 cm. alta, tota tomento albo-pannoso persistente vestita. Caulis crassus, dense pannosus, crebre foliosus, alatus, superne in inflorescentiam longam spiciformem cylindricam compactam simplicem vel a medio ramosam abiens. Rami crassi rigidi erecto-patuli, spicastro terminali multo breviores. Folia omnia utrinque dense albo-tomentosa, crassiuscula, integra vel crenulata. Folia basalia petiolo crasso 2–5 cm. longo praedita; lamina 5–9 cm. longa, 2–5 cm. lata, obovata, acuta vel apiculata. Folia caulina oblonga vel obovata, acutiuscula vel apiculata, basi in alas longe decurrentes producta. Glomeruli 2–7-flori, compacti. Bracteae triangulares vel lanceolatae, acuminatae, flores non vel vix superantes. Flos primarius glomeruli pedicello 1–2 mm. longo et bracteolis parvis linearibus praeditus; flores ceteri sessiles. Calyx 8–10 mm. longus, sicut bracteae bracteolaeque tomento denso pannoso non deterili vestitus, ad $\frac{3}{4}$ in lacinias lanceolatas acutas non acuminatas divisus. Corolla lutea, circ. 2 cm. diam., post anthesin diu persistens, ± pellucide punctata, extra tomentosa, intus glabra; tubus

3 mm. longus, superne ampliatus; limbus subconcavus, lobis orbicularibus. Filamenta omnia inter se libera, inferne nuda, ceterum usque ad antheram papillis luteis, apice vix clavatis densissime villosa. Antherae omnes reniformes, medifixae, etiam duae anticae ad connectivum papillosum. Stylus circ. 10 mm. longus, basi tomentosus, stigma spatulato terminatus. Capsula elliptica, 7-9 mm. longa, 4-5 mm. lata, erostris, tomento lanato tandem detersili vestita, calycem subaequans; pericarpium crassum. Semina obconico-prismatica, 0.7-0.8 mm. longa, 0.5-0.6 mm. lata, seriatim foveolata, foveolis cujusque seriei longitudinalis 4-6. Floret Jun.-Aug.

Prov. Antalya (Lycia): Çalbalı Da. above Tepe Delen Ya., 1,900-2,000 m., biennial, 14 July 1949, Davis 15326 (*unica*); Çalbalı Da., between Fesliken Ya. and Kar Çukuru, 14 July 1949, Davis 15415; *distr. Kemer (Lycia)*, Tahtalı Da., by path from Çukur Y. to Tekirova, 1,500 m., limestone scree, 17 Aug. 1947, Davis 14159 (*holotypus* in *Herb. Kew.*; *isotypus* in *Herb. Edin.*); Tahtalı Da. at Gürleyik Ya., 1,400 m., 11 July 1949, Davis 15345, and between Gürleyik Ya. and Peynirlik Ya., scree, 10 July 1949, Davis 15101.

The habit of *V. Davisianum* is like that of *V. pycnostachyum* Boiss. et Heldr. var. *uschakense* Murb. It differs from the latter primarily in its very compact uninterrupted spikes, different capsules, and longer more acute calyx-teeth.

Verbascum detersile Boiss. et Heldr. in Boiss., *Diagn. Ser.* 1 (12) 15 (1853).

Prov. Antalya, distr. Kemer (Lycia): Gönük, 0-100 m., 7 July 1949, Davis 15024.—Originally described from Mt. Climax, between Gönük and Antalya.

Verbascum dumulosum Davis et Huber-Morath, sp. nov. (Sect. *Bothrosperma* Murb., Subsect. *Singuliflora* Murb., A. *Cladotricha* Murb., b. *Ebracteolata* Murb., β. *Flores Isandri*).

Affinis *V. Pestalozzae* Boiss., sed inflorescentiis glabrescentibus glandulosis, calycis dentibus brevioribus angustioribus, floribus minoribus, filamentis anticis apice nudis recedit.

Planta perennis, humilis, 15-30 cm. alta, basi suffruticosa et valde ramosa, inferne tomento cinereo denique flavo-ferrugineo dense pannosa, superne sparse vel modice stellato-pilosa, modice vel dense glandulosa. Rami omnes inflorescentiis terminati, vetuli perbreves procumbentes vel adscendentes tomento flavo-ferrugineo dense pannosi, foliis approximatis praediti, ex axillis ramos annotinos paucifolios molliter cinereo-pannosos, racemo erecto simplice vel plerumque inferne ramoso 6-18 cm. longo terminatos emittentes. Folia crassiuscula, utrinque dense cinereo- vel demum subferrugineo-tomentosa, obsolete vel plerumque distincte crenulata, subtus reticulato-nervosa; inferiora longiuscule petiolata, elliptica vel ovato-elliptica, obtusiuscula vel obtusa, lamina 3-6 cm. longa, 1.5-2.5 cm. lata, petiolus 2-3 cm. longus; superiora angustiora, breviter petiolata vel sessilia. Racemi demum laxiflori, sparse vel modice stellato-pilosi, modice vel dense glandulosi. Bracteae lineares, 3-10 mm. longae, ebracteolatae. Calyx 3-6 mm. longus, sicut bracteae pedicellique glandulosus et stellato-pilosus, usque ad basin in lacinias anguste lineares acutas divisus. Corolla parva lutea rotata, 10-15 mm. diam., non pellucide punctata, extra parce stellato-tomentosa et parce glandulosa, intus ad basin loborum superiorum parce ciliata. Filamenta antica apice glabra, ceterum ut postica papillis longis flavidis cum violaceis intermixtis, superioribus apice clavatis dense villosa.

Antherae omnes reniformes, medifixae; connectivum anticarum non papillosum. Stylus 6–7 mm. longus, basi laxe tomentosus, superne parum incrassatus, stigmatem hemisphaerico terminatus. Capsula globosa, 3–4 mm. diam., dense tomentosa, demum glabrescens, rostro recto 1 mm. longo praedita. Semina minuta, 0.5 mm. longa, 0.4 mm. lata, seriatim foveolata, foveolis cujusque serei longitudinalis 4–5. Floret Jun.

Prov. Antalya (Pisidia): ruins of Termessus, 950 m., 23 June 1948, J. Renz (*holotypus* in Herb. Huber-Morath); *ibid.*, in the walls of temples, forming a rounded 1 ft. shrub, 11 Aug. 1947, Davis 13953—*inflorescentia emarcida*; *ibid.*, 19 July 1949, Davis 15447 (*fruct.*).

This saxatile species is related to *V. Pestalozgae* Boiss., but differs in its glabrescent glandular inflorescences, shorter and narrower calyx-teeth, and smaller flowers with the anterior filaments glabrous at the apex.

Verbascum flavipannosum Huber-Morath in Candollea, **12**, 210 (1949).

Prov. Konya, distr. Bozkeir (Isauria): S. Karance D. between Geyik Da. and Bozkir, biennial, specimens grazed, filaments more or less violet, 2 Sept. 1947, Davis 14628.

Verbascum glomeratum Boiss., Diagn. Ser. 1 (4) 52 (1844).

Prov. Denizli (Caria): Taş Ocağı near Denizli, hillsides, biennial, leaves golden-floccose, filaments yellow, 13 July 1947, Davis 13275, and between Çukur Köy and Kizilhissar, on conglomerate, 13 July 1947, Davis 13284; distr. Acipayam, on Boz Da. between Abbas and Geyran Ya., 16 July 1947, Davis 13313, and Monastir Ormani between Abbas and Acipayam, in open *Pinus Brutia* forest, 18 July 1947, Davis 13451. Prov. Muğla, distr. Fethiye (Lycia): foot of Girdev Da. near Girdev Go., 1,800 m., rocky hillsides, biennial, 4 Aug. 1947, Davis 13814. Prov. Antalya, distr. Kemer (Lycia): Teke Da. at Ovacik, 1,100 m., at edge of plain where scrub and forest have been cleared, biennial, fl. large, 12 July 1949, Davis 15190; distr. Gebiz (Pisidia), Bozburun Da. between Pinargözü Y. and Boğaz Azzi, 23 July 1949, Davis 15449. Prov. Konya, distr. Bozkeir (Isauria): Bozkir vadisi, leaves tawny, 7 Sept. 1949, Davis 16598.

Verbascum glomerulosum Huber-Morath in Candollea, **12**, 194 (1949).

Prov. Antalya, distr. Alanya (Isauria): above Gedevet Y. near Durbanas, N. of Alanya, in *Pinus nigra* subsp. *Pallasiana* forest, 25 Aug. 1949, Davis 14270.

Verbascum inulifolium Huber-Morath, spec. nov. (Sect. *Bothrosperma* Murb., Subsect. *Singuliflora* Murb., A. *Cladotricha* Murb., b. *Ebracteolata* Murb., β . *Flores Isandri*).

Species suffruticosa, distinctissima, foliis simulantibus ea quae *Inula heterolepis* Boiss. monstrat.

Planta perennis humilis, 20–60 cm. alta, basi suffruticosa et valde ramosa, e collo radices pluricaulis, tota tomento molli albo-pannoso dense vestita; inflorescentia insuper modice glandulosa. Rami teretes dense foliosi, alii elongati in paniculam abeuntes, multo breviores anno sequente floriferi. Folia omnia parva crenulata crassiuscula dense albo-pannosa; folia inferiora mediaque ramorum fertiliū obtusissima, petiolo 0.5–2 cm. longo praedita,

lamina late ovata vel obovata vel orbiculata, 1.5-4 cm. longa, 1-3 cm. lata, in axillis \pm fasciculiferis; folia superiora minora ovata vel late elliptica, obtusa vel obtusiuscula vel acutiuscula, sessilia, \pm semiamplexicaulia; folia ramorum steriliurn \pm petiolata, minora, congesta. Panicula laxiflora 8-25 cm. longa \pm ramosa; rami tenues, 5-10 cm. longi, ascenderet erecti. Flores in bractearum axillis solitarii. Bractee acutae, inferiores lineari-lanceolatae, superiores lineares, 2-10 mm. longae, dense stellato-tomentosae nec non modice glandulosae. Pedicelli ebracteolati, circ. 1 mm. longi, erecti. Calyx 4-8 mm. longus, sicut pedicelli bracteolaeque pilis stellatis tomentosis necnon glandulis stipitatis sparsis obsitus, usque ad basin in lacinias lanceolato-lineares acutas divisus. Corolla lutea, rotata, circ. 1.5 cm. diam., non pellucido-punctulata, extra stellato-tomentosa, intus ad basin loborum superiorum parce ciliata, tubus 0.5 mm. longus, lobi orbiculares. Filamenta antica apice glabra, ceterum ut postica papillis violaceis apice \pm clavatis dense villosa. Antherae omnes reniformes mediofixae, connectivum anticarum non papillosum. Stylus 6 mm. longus, inferne laxe tomentosus, superne incrassatus, stigmate obovato terminatus. Capsula stellato-pilosa, ovata vel elliptica, brevissime rostrata, 4-5 mm. longa, 2-3 mm. lata; pericarpium crassum. Semina obconico-prismatica, circ. 1 mm. longa, 0.7 mm. lata, seriatim foveolata, foveolis cujusque seriei longitudinalis 4-6. Floret Jun.

Prov. Mersin, distr. Silifke (Cilicia Trachea): above Silifke on the road to Gülnar, rocky slopes in *Pinetum Brutiae*, 400 m., a very woody perennial, 20 Aug. 1949, Davis 16353 (*fruct.*); above Silifke on the road to Gülnar, *Pinetum Brutiae*, 23-24 km. from Silifke, 780-840 m., 9 June 1950, Huber-Morath 9512 (*holotypus* in Herb. Huber-Morath; *isotypus* in Herb. Boiss.).

The new species is a very peculiar one, allied to the biennial *V. isauricum* Boiss. et Heldr. It has leaves like those of *Inula heterolepis* Boiss., and must be ranged in the system between *V. isauricum* Boiss. et Heldr. and the frutescent species like *Verbascum Pestalozzae* Boiss. and *V. dumulosum* Huber-Morath et Davis.

Verbascum isauricum Boiss. et Heldr. in Boiss., *Diagn. Ser. I* (12) 22 (1853).

Prov. Konya, distr. Ermenek (Cilicia Trachea): Ermenek, filaments violet, 14 Aug. 1949, Davis 16192 (*locus classicus*).

Verbascum kastamunicum Murb., *Monogr. Verbascum*, 265 (1933).

Prov. Ankara (Galatia): Beynam, steppe, biennial, filaments yellow, 5 July 1947, Davis 13040.

Verbascum* \times *kemerense Huber-Morath, *hybr. nov.* (*V. cheiranthifolium* Boiss. \times *V. orgyale* Boiss. et Heldr.).

Planta inter species dictas intermedia. Differt a *V. cheiranthifolio* Boiss.: planta superne glabrescens, calyx brevior, 1.5 mm. longus, laciniae calycis angustiores, sublineares. A *V. orgyale* Boiss. et Heldr. differt: caulis humilior, 70 cm. altus, gracilior, bractee triangulari-lanceolatae nec subulato-lineares. —Grana pollinis tabescentia.

Prov. Antalya, distr. Kemer (Lycia): Kesme Boğ. near Kemer, 8 July 1949, Davis 15151 (*holotypus* in Herb. Kew.).

Verbascum lasianthum Boiss. apud Benth. in DC., *Prodr.* 10, 234 (1846).

Prov. Ankara (Galatia): Beynam, in fallow fields, biennial, filaments yellow, 5 July 1947, Davis 13004. *Prov. Isparta, distr. Sütçüler (Pisidia)*: Daribükü, in fallow fields near the bridge, 30 July 1949, Davis 15899.

Verbascum leptocladum Boiss. et Heldr. in Boiss., *Diagn. Ser. 1* (12) 10 (1853).

Prov. Antalya (Pamphylia): plain between Antalya and Yenice Kahve, 19 July 1949, Davis 15463 (*locus classicus*).

Verbascum leuconeurum Boiss. et Heldr. in Boiss., *Diagn. Ser. 1* (12) 27 (1853).

Prov. Konya, distr. Ermenek (Isauria): Göksu D. between Ermenek and Sarıvadi, on the N. side of the valley at 1,000 m., very rare, 15 Aug. 1949 (*locus classicus*).

Verbascum Meinckeanum Murb., *Monogr. Verbascum*, 573 (1933).

Prov. Adana, distr. Babçe (Amanus): Haruniye, Sept. 1949, seed only collected (specimens in Herb. Davis taken from progeny raised in Royal Botanic Garden, Edinburgh, Oct. 1950—annual or biennial in cult., corolla bright yellow with a purple blotch at base of lobes, filaments violet—Davis).

Verbascum mucronatum Lam., *Encyc. Méth. Bot. 4*, 218 (1797).

Prov. Denizli (Caria): Denizli, in waste places with *V. sinuatum*, 12 July 1947, Davis 13299. *Prov. Muğla (Caria)*: Muğla, waste ground, 20 July 1947, Davis 13489.

Verbascum myriocarpum Boiss. et Heldr. in Boiss., *Diagn. Ser. 1* (12) 21 (1853).

Prov. Antalya, distr. Gebiz (Pisidia): above Kuzdere (in Kozlu D.) N. of Bozburun Da., 1,000 m., stony calc. slopes in *Pinus Brutia* forest, 28 July 1949, Davis 15839. *Prov. Mersin, distr. Anamur (Cilicia Trachea)*: between Beşkuyu and Çamurlu Y., 1,900 m., fl. small, corolla and filaments yellow, very rare, 17 Aug. 1949, Davis 16278.

Verbascum nudatum Murb., *Monogr. Verbascum*, 483 (1933).

Prov. Isparta, distr. Sütçüler (Pisidia): Daribükü (S. of Dedegöl Da.), on steep metamorphic slopes in maquis near the bridge, biennial, 30 July 1949, Davis 15898.

Verbascum obtusifolium Huber-Morath, sp. nov. (Sect. *Bothrosperma* Murb., Subsect. *Fasciculata* Murb., B. *Isandra* Murb., a. *Bracteolata* Murb., a. *Umbellulifera* Murb., 2. *Leianthera* Murb.).

Species insignis, nulli specierum aliarum valde affinis.

Planta basi suffrutescens, 4–12 dm. alta, pluricaulis, tota tomento crasso niveo densissime vestita, ad calyces bractaeasque insuper dense glandulosa. Caules e basi subligonosa arcuato-adscententes, teretes, crebre foliosi, tomento densissimo persistente obtecti, in inflorescentiam spiciformem interruptam simplicem vel parce ramosam abeuntes. Folia omnia utrinque tomento crasso albo vel flavescente densissime vestita; folia basalia petiolo angusto 1–6 cm. longo praedita, lamina \pm undulata, 6–18 cm. longa, 3–11 cm. lata,

ovata vel orbiculata, obtusa, integerrima vel obsolete crenulata, basi rotundata; folia caulina inferiora petiolo breviora praedita, late ovata vel elliptica, obtusa vel obtusiuscula; folia superiora ovata vel ovato-elliptica, sessilia, basi semiamplexicaulia. Glomeruli 4-9-flori \pm distantes. Bractae lanceolatae obtusiusculae 10-30 mm. longae, 3-15 mm. latae, dense tomentosae necnon dense glandulosae. Pedicellus floris primarii glomerulorum 1 mm. longus, basi bracteolis binis linearibus, 5-10 mm. longis, \pm 1 mm. latis, dense glandulosis modice tomentosis praeditus; pedicelli ceteri subnulli. Calyx 6-10 mm. longus, usque fere ad basin in lacinias lanceolato-lineares acutas divisus, dense glandulis breviter stipitatis obsitus, viscidulus, modice tomentosus. Corolla lutea, parva, 15 mm. diam., non pellucide punctata, extra parce stellato-tomentosa necnon glandulosa, intus ad basin loborum superiorum parce ciliata; lobi late obovati; tubus ampliatus, 1-2 mm. longus. Filamenta aurantiaca, omnia inter se libera, basi nuda, duo antica insuper apice nuda, ceterum ut postica papillis longis ochroleucis apice vix clavatis densissime velutina. Antherae omnes reniformes, medifixae. Stylus 7 mm. longus, inferne laxe tomentosus, superne incrassatus, stigmatibus capitato terminatus. Capsula late ovata, 5-6 cm. longa, 3.5-4.5 mm. lata, obtusa, breviter mucronata, stellato-tomentosa, glabrescens. Semina obconico-prismatica, 0.6-0.8 mm. longa, 0.5 mm. lata, seriatim foveolata, foveolis cujusque seriei longitudinalis 4-6. Floret Jun.

Prov. Mersin, distr. Gülnar (Cilicia Trachea): Bozagaç near Gülnar, 600 m., chalky slopes, stems 4-12, ascending-erect, 30-50 cm. tall, arising in a ring from below the central 1-4 rosettes, 20 Aug. 1949, Davis 16359; *distr. Silifke (Cilicia Trachea)*, above Silifke on road to Gülnar, *Pinetum Brutiae*, 11 km. from Silifke, 450 m., 9 June 1950, Huber-Morath 9516 (*holotypus* in Herb. Huber-Morath; *isotypus* in Herb. Boiss.).

The new species is without near allies, and is very different in habit and affinities from the other two glandular plants of the group *Leianthera* Murb., with yellow filaments—*V. Antinori* Boiss. and *V. deterrentis* Boiss. et Heldr. *V. Antinori* has decurrent leaves; *V. deterrentis* is biennial, not perennial, and has an indumentum that is "*floccoso-bombycinum, non albo-pannosum*." *V. obtusifolium* shows some affinity with the not yet described *V. chionophyllum* Huber-Morath, a frutescent species from Mut belonging to Subsect. *Singuliflora*.

Verbascum orgyale Boiss. et Heldr. in Boiss., *Diagn. Ser. 1* (12) 15 (1853).

Prov. Denizli, distr. Acipayam (Caria): Boz Da., 1,500 m., in *Pinus nigra* subsp. *Pallasiana* forest, biennial, rarely perennial, flowers small with yellow filaments, 16 July 1947, Davis 13395. *Prov. Antalya, distr. Kemer (Lycia):* Tahtali Da. by Kuzdere Y., 1,200 m., 8 July 1949, Davis 15118.

Verbascum Pestalozzae Boiss., *Diagn. Ser. 1* (12) 25 (1853).

Prov. Antalya (Lycia): Çalbali Da. in crevices of limestone rocks and cliffs at 2,000 m., hemispherical perennial, corolla and filaments yellow, 14 July 1949, Davis 15275.

This very beautiful alpine was discovered by Pestalozza "*in montibus elatis Lyciae*" in 1846. It seems very probable that Çalbali (Bereket) Dağ is the *locus classicus*, as Pestalozza certainly visited that mountain, discovering there *Asyneuma lycium* (Boiss.) Bornm. and *Minuartia Pestalozzae* (Boiss.) Mattf. which I collected on the same cliffs as the *Verbascum*.—Davis.

Verbascum pycnostachyum Boiss. et Heldr. in Boiss., *Diagn. Ser. 1* (12) 11 (1853).

var. **pycnostachyum**.

Prov. Denizli, distr. Acipayam (Caria): Acipayam, on chalky waste ground, biennial, 18 July 1947, Davis 13450. *Prov. Konya, distr. Bozkır (Isauria)*: Bozkır, 1,100 m., biennial, 7 Sept. 1949, Davis 16599.

var. **uschakense** Murb. in Lunds Univ. Årsskrift, n.f., 32 (1) (Nachtr. *Verbascum*) 32 (1936).

Prov. Antalya, distr. Gebiz (Pisidia): Bozburun Da., between Boğaz Azzi and Tozlu Çukur Y., 1,500 m., biennial, 24 July 1949, Davis 15571.

Verbascum Renzii Huber-Morath in Fedde, *Repert.* 46, 175 (1939).

Prov. Muğla (Caria): near Doğuşbelen, dry slopes, 20 July 1947, Davis 13481; *distr. Köyceğiz (Caria)*, Sandras Da. near Köklüce, 1,500 m., 22 July 1947, Davis 13531.

Verbascum sinuatum L., *Sp. Pl.* 178 (1753) var. **sinuatum**.

Prov. Denizli (Caria): Denizli, waste ground, 12 July 1947, Davis 13227.

Verbascum splendidum Boiss., *Diagn. Ser. 1* (4) 53 (1844).

Prov. Muğla (Caria): Muğla, waste ground, 20 July 1947, Davis 13490. *Prov. Antalya, distr. Elmalı (Lycia)*: Yuva, by village in dry water course in *Quercus coccifera* maquis, often several basal rosettes (biennial?), 7 Aug. 1947, Davis 14222.

Verbascum symes Murb. et Rech. fil. in Lunds Univ., Årsskrift, n.f., 32 (1) (Nachtr. *Verbascum*) 37 (1936).

Prov. Muğla (Caria): near Muğla, limestone slopes, very irritating indumentum, 20 July 1947, Davis 13485.

Verbascum tauri Boiss. et Kotschy in Boiss., *Diagn. Ser. 2* (3) 145 (1856).

Prov. Niğde, distr. Ulukışla (Cilicia): N. side of Bulgar Da. between Sari Tepe Y. and Alihoca, biennial, filaments violet, 3 Sept. 1949, Davis 16527.

Verbascum mucronatum Lam. × **V. sinuatum** L. var. **sinuatum**.

Prov. Denizli (Caria): Denizli, on waste ground between the parents, 12 July 1947, Davis 13228—*grana pollinis tabescentia*. This hybrid has already been found by Delile (Thellung, *La flore adventice de Montpellier*, 469; cf. Murbeck, *Monogr. Verbascum*, 200).

Verbascum cheiranthifolium Boiss. × **V. orgyale** Boiss. et Heldr.?

Prov. Antalya, distr. Alanya (Isauria): Han Boğaz forest near Geyik Da., 1,500 m., scattered in *Abietum*, biennial, stem about 1.5 m. tall, paniced, 30 Aug. 1947, Davis 14715—*grana pollinis 90 per cent. tabescentia*. (No other *Verbascum* was seen in this locality.—Davis.)

Verbascum hybr.—**V. cheiranthifolium** Boiss. × **V. sp.**

Prov. Muğla, distr. Köyceğiz (Caria): between Dalaman and Göcek, 300 m., in *Pinetum Brutiae*, by roadside, 26 July 1947, Davis 13565; *distr. Fethiye*

(*Lycia*), Girdev Da. above Girdev Go., 2,000 m., in fields, 5 Aug. 1947, Davis 14045—*grana pollinis* 80 per cent. *tabescentia*.

Verbascum sp. aff. *V. nudato* Murb.

Prov. *Antalya*, distr. *Alanya* (*Pamphylia*): between Alanya and Kizil Alan, rocky slopes and rocks, biennial with rosettes like *Mathiola sinuata*, 24 Aug. 1947, Davis 14443; between Kizil Kaya Dibi and Kizil Alan, N. of Alanya, rocky places, biennial, 24 Aug. 1947, Davis 14455 (*fruct.*).

This could be a form of *V. nudatum* Murb., or more probably a new species. Flowers are indispensable for determination.

Veronica Anagallis-aquatica L. var. *anagalliformis* Bor., Fl. Centr. Fr. ed. 3, 2, 489.

Prov. *Kutahya*, distr. *Gediz* (*Phrygia*): Şaphane Da., 1,500 m., edge of stream, fl. lilac blue, 27 Aug. 1950, Davis 18500. Prov. *Muğla*, distr. *Fethiye* (*Lycia*): Girdev Da., 1,600 m., edge of Girdev Go., 4 Aug. 1947, Davis 13752 (*forma*).

In its glandular-hirsute inflorescence, the last gathering approaches *V. Michauxii* Lam., from which it differs in habit, obtuse capsules and smooth leaves; one specimen has sparingly dentate calyx-teeth.

Veronica Beccabunga L., Sp. Pl. 12 (1753).

Prov. *Muğla*, distr. *Fethiye* (*Lycia*): Girdev (Eren) Da., near Bel Y., 2,000 m., in stream, fl. blue, 6 Aug. 1947, Davis 13967. Prov. *Denizli* (*Caria*): Baba Da. above Kadiköy, 1,500 m., in stream, fl. pale lilac, 23 Aug. 1950, Davis 18455.

Veronica catenata Pennell, Rhodora, 23, 37 (1921).—*V. aquatica* Bernh. (1834) non Gray (1821).

Prov. *Muğla*, distr. *Köyceğiz* (*Caria*): Sandras Da. at Köklüce, stream, 22 July 1947, Davis 13628 (*forma*).

The gathering differs from British material in its smaller elliptical-orbicular capsules. In its fruits being a little longer than broad, my plant shows some affinity with *V. anagalloides* Guss. Sect. *Beccabunga* becomes extremely critical in Western Asia, and much more material is required before the constituent species can be better understood.

The nomenclature of this species, until recently known in Britain as *V. aquatica* Bernh., is fully discussed by J. H. Burnett in Watsonia, 1 (6) 349-353 (1950).

Veronica cuneifolia Don in Ann. Nat. Hist. 7, 457 (1841).

subsp. *cuneifolia* (*V. cariensis* Boiss., Diagn. Pl. Or. Ser. 1 (4) 75: 1844).

Prov. *Muğla*, distr. *Fethiye* (*Lycia*): Girdev Da., 2,400 m., fl. blue, 5 Aug. 1947, Davis 14025; *ibid.*, 2,000 m., 5 Aug. 1947, *sine num.* Prov. *Isparta*, distr. *Sütçüler* (*Pisidia*): Dedegöl Da. above the tarn, fl. blue, 3 Aug. 1949, Davis 16009 (*forma*).

The last gathering approaches subsp. *isaurica* Davis in its capsule shape and short calyx.

subsp. *isaurica* Davis, subsp. nov.

A typo indumento plerumque glandulifero longiore magis copioso, capsula obcordata basi rotundato-cuneata (haud latius rotundata), lobis calycinis brevioribus recedit.

Rami prostrati, caulibus foliosis 3-8 cm. longis. Folia obovato-oblonga, 6-11 mm. longa, in petiolum brevem attenuata, utrimque 4-6-inciso-crenata, pilis glandulosis et eglandulosis viscoso-hirsuta (rare pilis glandulosis fere absentibus), virescentia. Racemi 1-3 cm. longi, deinde laxiusculi, secundi. Pedicelli statu florifero calycem aequantes, fructu ad duplo longiores. Sepala linearia obtusa plerumque glandulifera quam capsula breviora. Corolla caerulea, 5-6 mm. lata. Capsula obcordata, basi rotundato-cuneata, 4 mm. longa, 4-5 mm. lata. Semina leviter biconvexa, 1.75 mm. diametro, facie interiore umbilico margine elevato donato instructa minute rugulosa.

Prov. Antalya, distr. Alanya (Isauria): Ak Da. (S. of Geyik Da.) 2,400-2,500 m., in earthy hollow, 28 Aug. 1947, Davis 14375 (*holotypus in Herb. Kew.*); Geyik Da., 2,600 m., 31 Aug. 1947, Davis 14542; *ibid.*, 2,700 m., fl. blue, 31 Aug. 1947, Davis 14558 and 14570; *ibid.*, July 1845, Heldreich.

The new subspecies holds a position that is both morphologically and geographically intermediate between subsp. *cuneifolia* (from Lydia, Caria, Phrygia and Pisidia) and the more easterly *V. dichrus* Schott and Kotschy from the Cilician Taurus and Thyianitis (Cappadocia). It usually differs from both in its glandular indumentum.

I am taking up the name *V. dichrus* Schott et Kotschy (Syn. *V. pilosa* (Benth.) Römpf; *V. cuneifolia* Don var. *villosa* Boiss.) for the species from the Cilician Taurus. Römpf (in Fedde, Repert. Beih. 50, 114: 1928) gave the name *V. pilosa* (Benth.) Römpf to the Cilician plant, and cited *V. dichrus* as a synonym of *V. cuneifolia*. However, *V. dichrus* and *V. pilosa* (Benth.) Römpf appear to be conspecific, so that the former, being the older name, must be adopted. Furthermore, *V. pilosa* (Benth.) Römpf is a later homonym of *V. pilosa* L., and therefore illegitimate.

All the characters used by Römpf (*l.c.*) to distinguish *V. dichrus* (as *V. pilosa* (Benth.) Römpf) from *V. cuneifolia* occasionally break down, except for the seed shape on which he lays great stress, using it to divide *Chamaedrys* b. *Orientalis* into two main groups—one with hollowed and the other unhollowed seeds. While this seed difference remains absolute, I tentatively accept *V. cuneifolia* and *V. dichrus* as specifically distinct from one another. The allied *V. surculosa* Boiss., from Cilicia, I have not seen; it was accepted as a species by Römpf (*l.c.*).

Veronica glaberrima Boiss. et Bal. in Boiss. Diagn. Pl. Or. Ser. 2 (3) 172 (1856).—*V. conferta* Boiss. (1879).

Prov. Antalya, distr. Alanya (Isauria): N.W. side of Ak Da. (S. of Geyik Da.), near the tarn on waste flat ground, 28 Aug. 1947, Davis 14347.

Veronica oxycarpa Boiss., Diagn. Pl. Or. Ser. 1 (7) 44 (1846).

Prov. Muğla, distr. Fethiye (Lycia): Girdev (Eren) Da., below Bel Y., 1,700 m., in stream, 7 Aug. 1947, Davis 13745 (form with the non-glandular capsules more closely set than in the type). *Prov. Antalya, distr. Alanya (Isauria):* near Sobiçimen Y. at N. foot of Geyik Da., 2,000 m., marshy ground, 1 Sept. 1947, Davis 14678 (form with the capsule less pointed than in the type, and the lower 2-3 pairs of leaves stalked. These characters suggest an affinity with *V. beccabungoides* Bornm. of which I have not seen authentic material).

Wulfenia orientalis Boiss., Diagn. Ser. 1 (4) 75 (1844).

Prov. Adana, distr. Babçe (Amanus): Dildil Da. above Haruniye, 800 m., 16 Aug. 1949, Davis 16454; and cult. in Hort. Edin.

This beautiful species, only known from the Amanus region, is most nearly related to the Albanian *W. Baldacii* Degen.

ADDENDUM

Siphonostegia syriaca (Boiss. et Reut.) Boiss., Fl. Or. 4, 471 (1879).

Prov. Antalya, distr. Kemer (Lycia): Tahtali Da., 1,600 m., rare on limestone cliff, plant suffrutescent green viscid, fl. with gloomy purple hood, lip yellowish shaded with purple, 17 Aug. 1947, Davis 14183.

This remarkable perennial is confined to isolated localities in Southern Anatolia and Greece. It is evidently a relict, the other two species of the genus being annuals found in China. In facies *S. syriaca* resembles the related North American genus *Schwalbea* L. more closely than the other species of *Siphonostegia* which, however, it resembles in the diagnostic structure of its calyx. It was originally made the type of a new genus: *Lesquereuxia* Boiss. et Reuter (Boiss., Diagn. Pl. Or. Ser. 1 (12) 43: 1853).